

The Iron Age

A Chilton Publication

THE NATIONAL METALWORKING WEEKLY • APRIL 21, 1955

What's behind
the aluminum
shortage?
See page 47

*Automatic Lumberjack
—1958?*



NEW


DEPARTURES OF TOMORROW



Cool-running chain saw, like every type of power saw in use today, uses New Departure ball bearings for longer life at peak efficiency.

Even Paul Bunyan couldn't match the pace of this "automatic lumberjack" of the future. It fells, sections and loads trees—all at the push of a button! The company that launches this wonder will probably look to New Departure for ball bearings. For New Departures have proved their ability to hold moving parts in perfect alignment, cut wear and friction, and work long hours without letup—or upkeep. Above all, New Departure has lived up to its name—being *first* with ball bearing advancements. So, when improving or designing a product, count on New Departure for the finest ball bearings.

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you can trust!*

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THERMOCOUPLE ALLOYS

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Chromel-Alumel thermocouple alloys are unconditionally guaranteed to register true temperature—e.m.f. values within close specified limits . . . $\pm 4^{\circ}\text{F}$. from 0° to 530°F .; $\pm \frac{3}{4}\%$ at operating temperatures from 531° to 2300°F .

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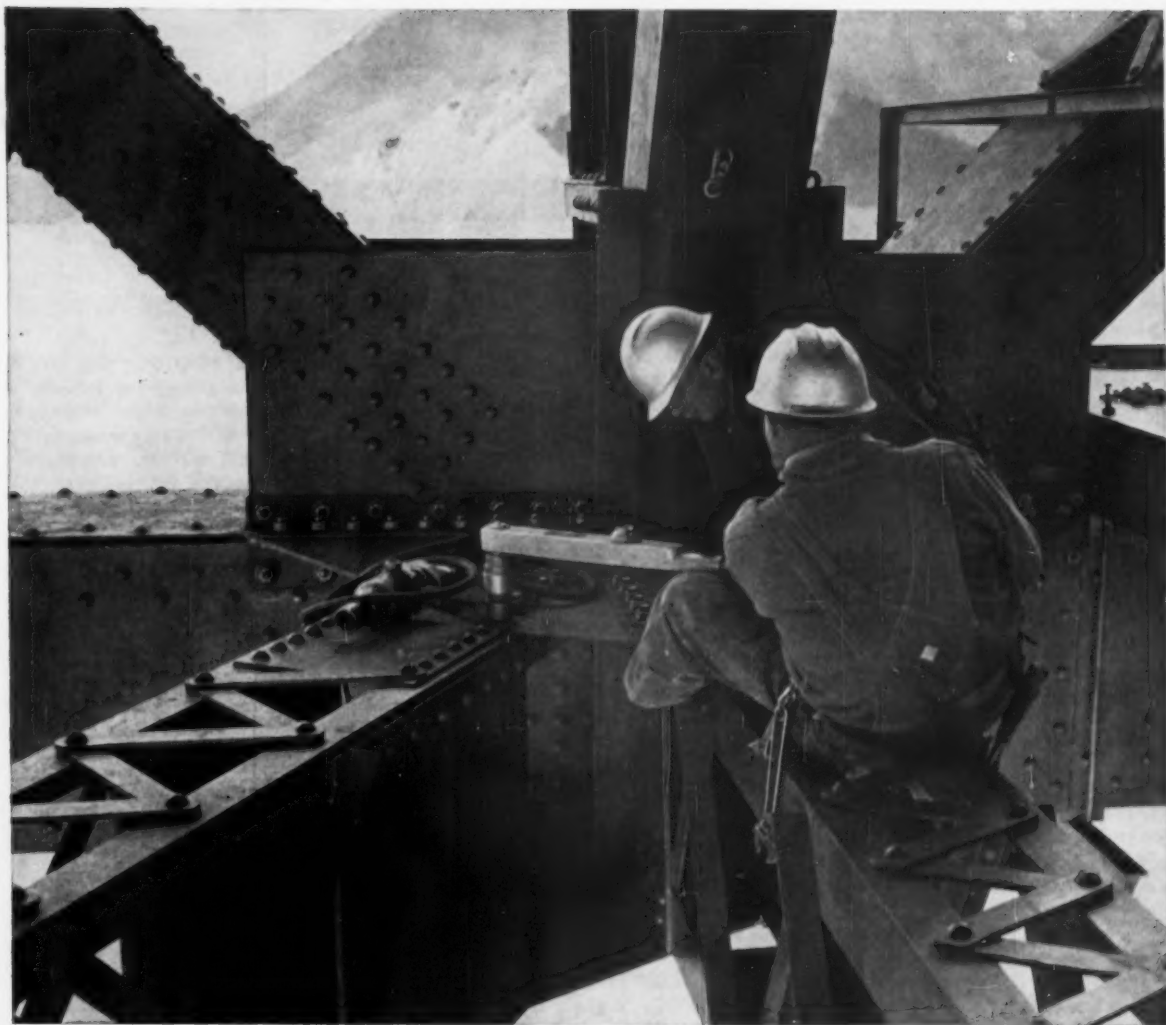
Ask for them by name! Your instrument manufacturer or pyrometer service company can supply your immediate requirements for plain or insulated wire and assembled couples. So ask for them by name . . . "Chromel-Alumel" thermocouples . . . trade names you can trust!



Chromel-Alumel thermocouple alloys are produced exclusively by

HOSKINS MANUFACTURING COMPANY

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Bracing for Golden Gate Bridge Fastened with High-Strength Bolts

Taken hundreds of feet above the waters of the Golden Gate, this photograph shows workers using a torque wrench to check the applied tension on one of the Bethlehem High-Strength Bolts connecting a gusset plate to a diagonal in the new bottom lateral system for the Golden Gate Bridge.

This new lateral system, extending the full length of the bridge, ties in with the east and west bottom chords to increase the torsional stiffness of the structure. It was installed by Judson Pacific-Murphy Corporation, and consists of 4700 tons of fabricated structural members, joined to the

original steelwork with 190 tons of Bethlehem High-Strength Bolts.

High-strength bolts were specified by the design engineers because of their ease of installation. With no unduly bulky equipment being required, the work could proceed smoothly, even during periods of high winds, resulting in a cost saving through reduced erection time.

Bethlehem High-Strength Bolts are readily installed. With two hardened washers used on each bolt—one under

the head, the other under the nut—the bolt head is grasped with a holding wrench, where necessary, while the nut is tightened to predetermined tension with a calibrated pneumatic impact wrench. It's as easy as that!

We have an interesting illustrated booklet, "High Strength Bolting for Structural Joints." Send for a copy.

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BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corp. Export Distributor: Bethlehem Steel Export Corp.

BETHLEHEM STEEL



Starred items are digested at the right

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THE IRON AGE, published every Thursday, with an additional issue in June, by CHILTON CO. (INC.), Chestnut & 54th Sts., Philadelphia 29, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, \$5 for 1 year, \$8 for 2 years in the United States, its territories and Canada. All others \$15 for 1 year; other Western Hemisphere countries, \$15; other Foreign Countries, \$25 per year. Single copies, 50¢. Annual Review Issue, \$2.00. Cables: "Ironage," N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

NEWS DEVELOPMENTS

INDUSTRY BOOSTS AID FOR EDUCATION — P. 51

Industry, with steel companies among the leaders, is gradually stepping up increased corporate allocations for higher education. Total contributions made during 1953 are estimated at \$70-\$75 million. Researchers estimate the figure will be upped in the years ahead to meet industry's growing need for college-trained people.

SEE NO LETUP IN HEAVY STEEL DEMAND — P. 52

Buyers who are waiting for the steel demand to ease are in for a disappointment. Demand will continue strong for the balance of the year. The traditional summer slump will be little more than a ripple this year. Automotive labor difficulty will be settled and other industry will continue to make heavy calls on steel production.

MICROFILM FINDS NEW USES, BIG SAVINGS — P. 54

A wide range of industrial and commercial uses of microfilm is bringing savings estimated at \$140 million annually. Protection of vital records, storage of limited reference material, duplication of financial papers are among growing list of applications. Handling ease rivals space saving as big microfilm advantage.

BRITISH STEEL RETURNS TO PRIVATE HANDS — P. 55

Private interests have taken back over half of Great Britain's steel industry. The government will continue to surrender control of the industry, which is expanding at a steady rate. Steel ingot and casting production hit a new high in February and the annual rate has climbed to 22,960,000 tons. Home steel demand exceeds output.

GLASS MAKERS SOLVE AUTOMOTIVE PROBLEMS—P. 64

Trend in auto design to more window surface brought problems of glare and distortion. Tinted glass proved satisfactory for night driving. Wraparound windshields brought production as well as optical problems, resulted in new expansion for glass industry.

PRICE CONTROL PUSH LOOKS SERIOUS — P. 69

Office of Defense Mobilization is winning many Congressmen over to the side of arming the government with price control powers. Move would give Administration authority to freeze wages, prices, credit. President's backing could bring quiet passage of measure but strong opposition is mounting.

IN METALWORKING

ENGINEERING & PRODUCTION

BLAST CUPOLA OFFERS IMPROVED MELTING—P. 87

Foundrymen and steelmen like what they've seen of the metallurgical blast cupola. It combines the operating characteristics of the blast furnace with the low pressure blast and continuous tapping features of the conventional cupola. It will work on a 100 pct scrap steel charge, make foundry iron without loss.

COMPACT UNIT INTEGRATES HEAT TREATING—P. 92

Floor space is usually at a premium in a mechanized production line—particularly so when it must include heat treating facilities. Now, hardening, quenching, washing and drawing are done in a 3 by 10-ft space. And two types of parts are treated side by side at a balanced production rate. One man handles the entire operation.

KEEP TRACK OF YOUR TOOLS AND GAGES—P. 94

Mass-produced parts in varying shapes and sizes can require a multitude of tools and gages. Keeping these production aids in ample and available supply takes efficient record keeping. This colored-card system helps achieve low-cost production.

USING MORE REFRACTORY CERAMIC COATINGS—P. 97

Modern ceramic coatings allow substitution of lighter gage metals, sometimes permit mild steels to replace higher alloy grades. Coatings extend service temperature limits of any steel grade, can even be machined after they're applied. New formulas and lower cost techniques would seem to make them worth a look when service temperatures exceed 1200°F.

CAST STRONG IRONS TO STOCK SHAPES—P. 100

High strength irons, cast to standard shapes and sizes and stocked at the foundry, offer the materials engineer the high physical properties he needs for many parts, and at low cost. Careful foundry practice produces quality bars, bushings and other shapes.

MARKETS & PRICES

WHAT'S BEHIND THE ALUMINUM SHORTAGE — P. 47

Aluminum users might as well face it; there is an aluminum shortage. Excessive inventory cutbacks by consumers in '54, resurgence of economy have put squeeze on aluminum. Heavy European scrap demand has aggravated secondary market. This is putting more pressure on primary supply. Price hike coming.

BULK MILK SHIPPING USES STAINLESS — P. 50

Trend to bulk milk pickup creates a new stainless steel market. Trend doubles stainless consumption each year, but should fill market in a decade. Old milk train and milk cans become obsolete. Tanks, tank trucks all need stainless sheets.

WORRIED STEEL BUYERS COURT WAREHOUSES — P. 143

Warehouses are feeling the full impact of surging steel demand. Anxious buyers are besieging distributors for tonnages to fill gaps in mill deliveries. Warehouse operators are finding that once-ample inventories of flat rolled products now look skimpy. Sheet, particularly, is running low. The run on warehouses may foreshadow development of conversion and gray market in sheets and other tight products.

COMPETITION BRINGS MOUNTING STOCK GAPS—P. 144

Heavy competition at the mill level is showing up in widening warehouse stock gaps for many products. No relief is seen from hard-pressed mills until late in third quarter. Big consumers are now paying warehouse prices to meet production needs. Plates, structurals and sheets are becoming tight at warehouse levels.

BRITAIN MOVES TO EASE COPPER SCARCITY — P. 150

In a move to remedy the copper shortage and also to bring down the fantastic prices that have been quoted for the metal on the London Metal Exchange, the British Board of Trade last week released 45,000 tons of copper from government stocks.

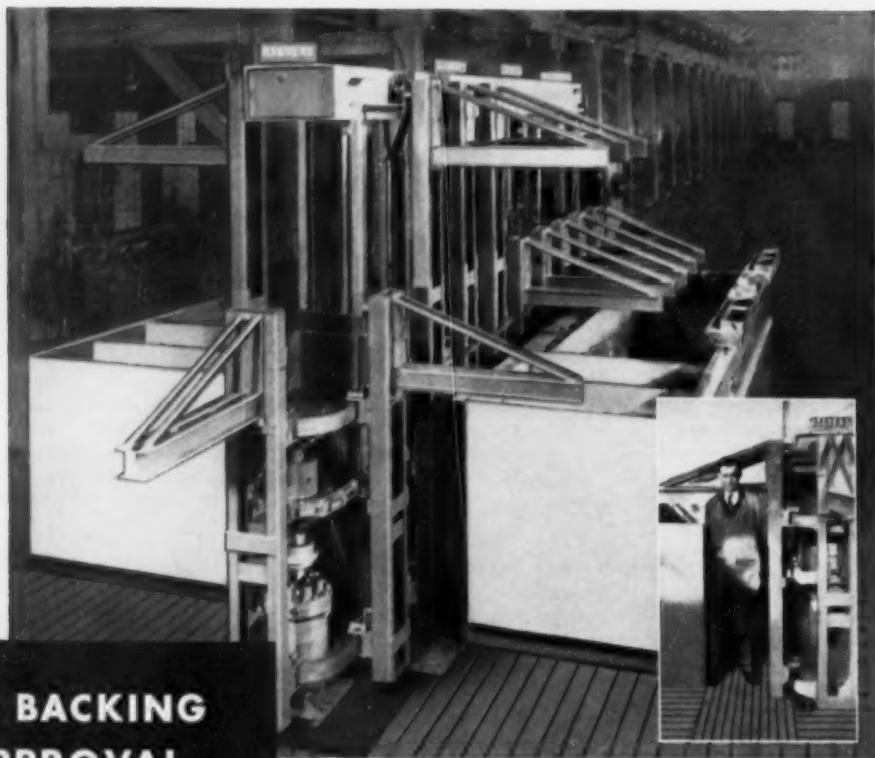
NEXT WEEK:

UNIFORM STRUCTURES FOR AUTOMATED MACHINING

Automated or semi-mechanized metalworking plants require "something extra" in metallurgical control; they can't bypass out-of-standard parts. Dana Corp.'s Marion Div. heat treats all incoming materials to establish uniform structures for its high-speed machining operations.

HOW GUARANTEED WAGE WILL AFFECT INDUSTRY

If GAW becomes a reality, how will it hit your business? Will you have to diversify? Will you have to plan your advertising to help smooth peaks and valleys? What else could you do to minimize effect of a guaranteed plan? These and other questions will be brought into focus in next week's special report.



**THEY ARE BACKING
THEIR APPROVAL
WITH ORDERS**

FOR THE NEW "STEVADOER" PLATING AND PROCESSING MACHINE *by* STEVENS

Discriminating metal finishing experts who have viewed it in operation are strong in their approval of the "Stevadoer," new automatic plating and processing machine by Stevens . . . and they are backing up their approval with orders.

The "Stevadoer" is all that its name implies — strong, rugged, with smooth vertical and horizontal movement. In addition it provides unlimited lift and heavy load capacity.

The side-arm design, pioneered by Stevens, which eliminates operating mechanism over solutions, still provides for delayed set-down mechanisms and skip tracks.

You'll like the featured "built-in" safety cat walk that can be provided between the processing tanks and

the mechanism on two-row machines, making anode servicing and tank or mechanical inspection an easy matter.

The new Stevens Stev-O-Matic automatic loader and unloader working with the new "Stevadoer" offers the last word in automation.

Write today for more information on this remarkable new machine for metal finishing.

See another new Stevens engineering triumph . . . the new "Little Steve" Automatic Plating Machine at the 4th Industrial Finishing Exposition — Booth 112, Public Auditorium — June 20 to 23, Cleveland, Ohio.

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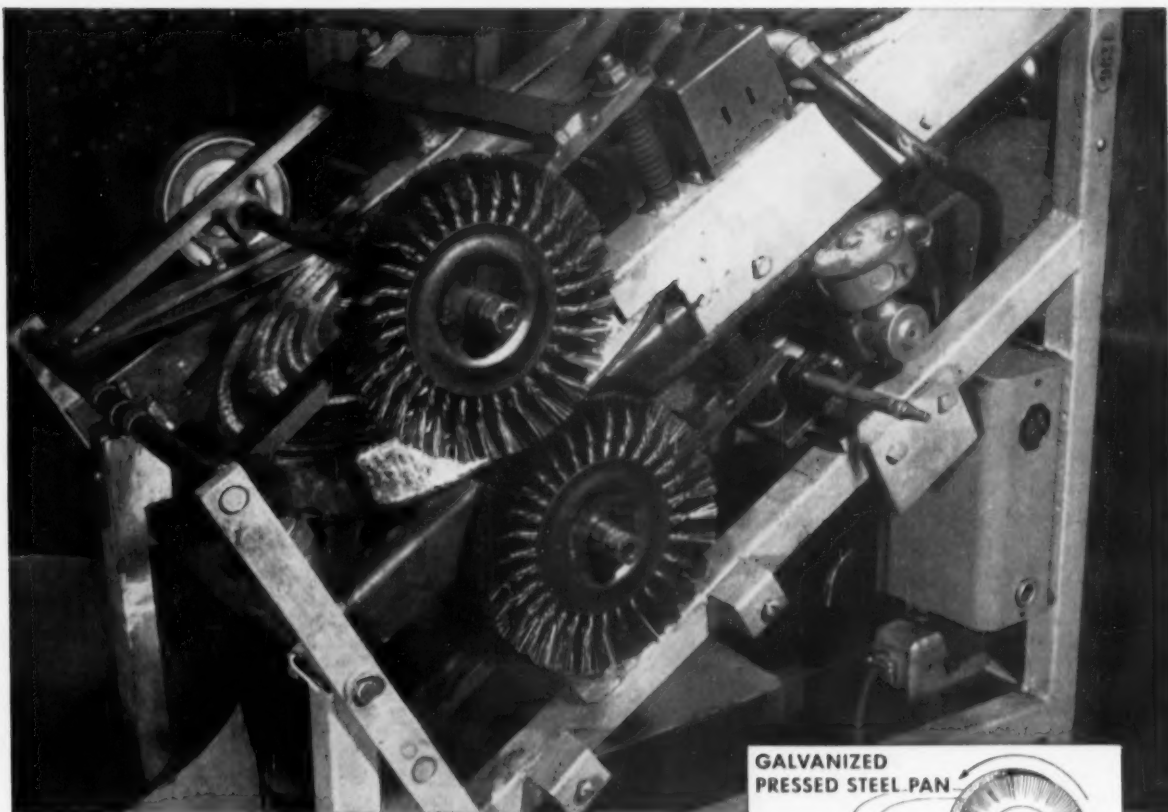
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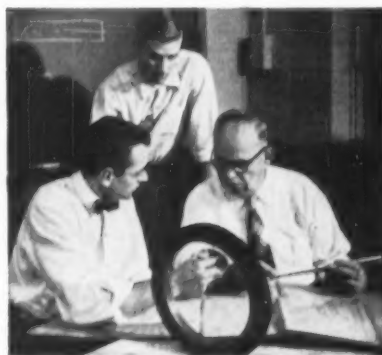
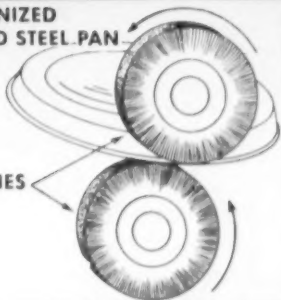
A touch of ingenuity and Osborn Power Brushing. That's all it takes to remove hard drips of zinc from these galvanized steel pans.

After pans are dipped for galvanizing, the operator merely drops them in place on this machine. Two Osborn Disc-Center® Brushes spin the pans, brush the spelter from the edges. In 10 seconds—all the time it takes for brushing, pans are ejected automatically.

Does this idea suggest an answer to a problem you have? An **Osborn Brushing Analysis** can show you where power brushing will help speed production, improve product quality. Call or write *The Osborn Manufacturing Company, Dept. F-31, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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April 21, 1955

Can you save



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on stainless?

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So right now at Ryerson you can save 7¼¢ a pound if you can use Type 430 instead of nickel-bearing types. Even on a single 48 x 120 sheet of 16-gauge stainless this means a cost reduction of \$7.47 with Type 430, plus additional savings because of lower weight. And you may also want to consider Type 430 as insurance against any shortage of nickel-bearing types.

You'll save time, in any case, by calling Ryerson because here you draw on the nation's

largest stocks of both straight-chrome and nickel-bearing Allegheny stainless and here you put unequalled stainless experience to work for you. So for quick, complete stainless service—call your nearby Ryerson plant.

Technical data on Type 430 or other stainless steels sent on request.

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BARS—Round, square, flat and hexagon, also angles

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and the Engineering Index.



Editorial:

What Price Quemoy and Matsu?

♦ ONE MAN will determine if or when we will help defend Quemoy and Matsu. The Joint Chiefs of Staff, the National Security Council and others have told President Eisenhower what they think. When the time comes he alone will bear the crushing burden of responsibility—and courage.

There are those who ask loudly why we should defend those "tiny" islands; as if there is nothing there except real estate. To some people we would be stark crazy to defend such small specks in the Formosan Strait.

But that is not the simple point. We are not interested in the mere physical aspect of Quemoy and Matsu. Something infinitely more important to freedom is involved. No one knows for sure if we will or will not defend these isles against a communistic attack.

It all depends on the Chinese Reds. If they insist on moving towards Formosa with invasion as their unmistakable goal they may commit the ghastliest blunder of this century. Yet it would be stupid strategy to tell the Reds what is in our minds—or what we intend to do—about Quemoy and Matsu.

These islands are symbolic in more ways than one. They are the "Stop, Look and Listen" for the Reds. They contain perhaps the hidden answer to the question, "Is the United States a paper tiger?" They may turn out to be the deterrent to World War III. Or they may be one more stepping stone to the onrush of communism in Asia.

All the hue and cry about these two Nationalist Chinese outposts would lead us to believe that, if we said "no" we won't defend them, or "yes" we will defend them, everything would be white or black. It isn't that easy. There will always be Quemoy and Matsus of various shades for us.

All the talk in Britain, in India, in Canada and in the United States will not change this one basic fact; sooner or later we must decide where we are going to stand up against the Reds. If it isn't Quemoy or Matsu it must be Formosa. Even General Eisenhower's severest critics concede that.

The free world did not stop Hitler in time—and so came World War II. Only history can tell us if Quemoy and Matsu will prove to have been the Free World's stand—if there is to be any history. Your President needs your support—and your prayers.

Tom Campbell

EDITOR

galvanite*

Where there is danger of parts rusting or corroding, causing product failure, many leading appliance manufacturers specify Sharon Galvanite®—the finest hot dip zinc coat steel marketed today.



special alloys

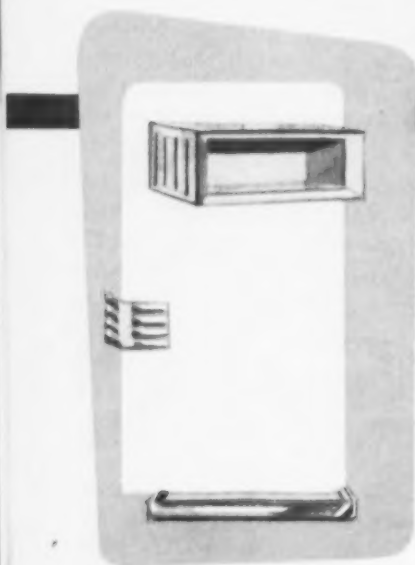
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dear editor:

letters from readers

Why Write Editorials About . . . ?

Sir:

Just read "Why Write Editorials About . . . ?" on p. 7.

Keep up the good work—keep on writing and keep in mind, please, that this reader, and perhaps many others, will still like your style, admire your thinking, and will still be proud of one who feels the pulse of the people and has the courage of his own convictions. *H. A. Roemer, Chairman, Sharon Steel Corp., Sharon, Pa.*

Sir:

Continue your excellent "bits." Furthermore your answer to your critics herein (Why Write Editorials About . . . ?) is the absolutely correct one! *Gilbert Cox, International Nickel Co., Rochester, N. Y.*

Sir:

I have just finished reading your editorial, p. 7, April 7 issue, "Why Write Editorials About . . . ?"

To accommodate your old and admiring readers, continue to follow the same practice that you have in the past as the editorial referred to is a very outstanding one indeed. *J. T. Somers, President, Wyckoff Steel Co., Pittsburgh*

Sir:

I just finished reading your editorial in the April 7 issue and wish to state that I heartily agree with the stand which you take with respect to editorials.

I look forward, from issue to issue, to the content of your editorials. *Bert Jody, Pittsburgh*

Sir:

This letter is inspired by your editorial in the April 7 issue. Permit me to urge you to continue to

write editorials "about Communism or about international affairs," since it is my considered judgment that one of Communism's most effective weapons is the fact that all too few of the citizens of our beloved United States are conscious of the seriousness of the situation. *G. D. O'Neill, Asst. to Chief Engineer, The Baltimore & Ohio Railroad Co., Baltimore, Md.*

Who Are These People?

Sir:

Your editorial "Who Are These People?" is the type of editorial that awakens our people, stirs our hearts to know the world we live in and how to live—in the world we know. *J. A. McLaughry, President, Quality Tools Corp., New Wilmington, Pa.*

Portable X-Ray

Sir:

In the Feb. 17 issue, p. 77, I noticed mention of a West Coast manufacturer that will soon be marketing a portable X-ray unit.

I am very interested in this unit and would very much like to have the name and address of the manufacturer. *Harold Ottobriani, Long Island City, N. Y.*

The manufacturer of this unit is Litton Industries, 336 N. Foothill Road, Beverly Hills, Calif. Write to Dr. J. B. Clark.—Ed.

Cold Extrusion

Sir:

We would appreciate receiving two tear sheets of the article appearing in your March 10 issue entitled "Short Cycle Anneal Restores Ductility in Cold Extrusions." *R. J. Hess, Vice-President, Lake Erie Engineering Corp., Buffalo, N. Y.*



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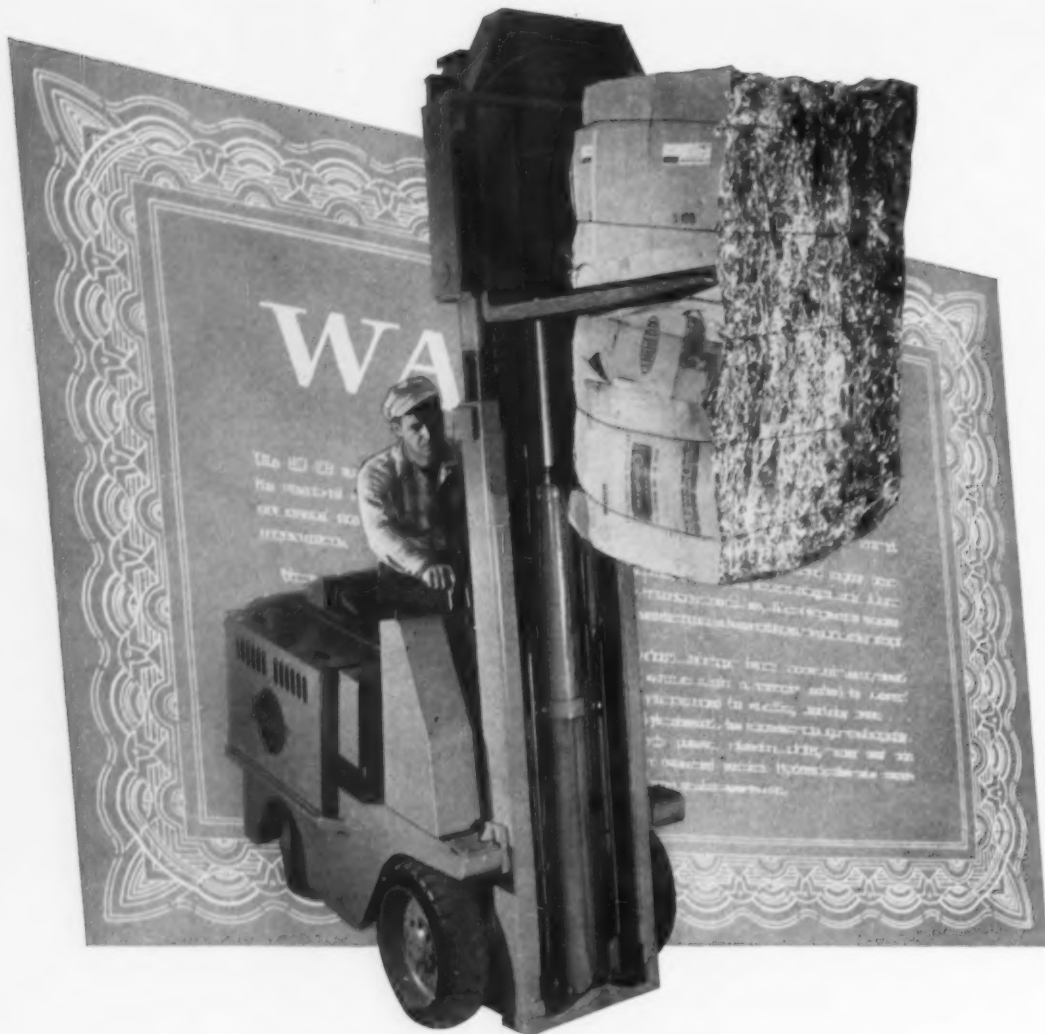
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Title _____

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ONE YEAR WARRANTY

when you buy an electric fork truck

All Baker battery-powered industrial trucks—including fork, platform, crane trucks and tractors—are warranted against defects for a full year from date of shipment.

As a truck purchaser, you should accept nothing less.

A one-year warranty assures you that the manufacturer has complete confidence in the materials and workmanship that go into his product. It gives you twelve months protected operation of the truck *under your conditions*—allowing ample time to detect imperfections, which might not show up during a 30, 60 or 90 day guarantee period.

Baker Trucks have a half-century reputation for outstanding performance, long life and low maintenance. For example: a fleet of the first Baker ram trucks ever built is still in service at a large midwestern steel mill after 32 years!

Let a Baker handling engineer give you the full story, or write for Bulletin 54B. The Baker-Raulang Company, 1227 West 80th Street, Cleveland 2, Ohio.

Baker.
handling equipment

5E2

fatigue cracks

The Fifth Estate (cont.)

... from last week wherein we told you that we were going to try to sell our house without the services of professional real estate agents. We have changed our mind. Lost our nerve. The following letter will perhaps explain.

Dear Mr. Blank:

How's business?

The house selling business, that is. We see you're in it now . . . or while you're at work more likely the wife is . . . up to her neck in bargain hunters, shoppers and telephone Annies who make life interesting for sellers with such sensible queries as:

- (1) How old is the bathtub?
- (2) Are there any other people on the street?
- (3) Does it have copper floors and double plumbing?
- (4) Will you take a second mortgage?
- (5) Are the beds made yet?
- (6) We have \$200 down, isn't that enough?
- (7) Can we see it at 3 o'clock tomorrow morning?
- (8) Is it close to the Stadium? My husband works there.
- (9) Will you hold it for us till next year?
- (10) My mother bought a better house for \$6000.

We are real good, Mr. Blank, at killing off these and other clowns who have a genius for wasting your time and irritating your missus and other sellers' missuses. We bury them in the basement of the wonderful new Laux Realty Company office in the Parma Legal Building at 5348 Pearl Rd.

Upstairs we have a red hot organization of full-time live-wire salesmen with accumulated realty sales experience of 25 years. They're so hot

by William M. Coffey

they keep selling us out of houses.

That's the pitch, Mr. Blank. Give us your house to sell. You need a deal and we need your house.

Let us put you out of the real estate business the easy, painless way, get your wife off the telephone hook and get the beds made again.

Tu 4-6400's the number.

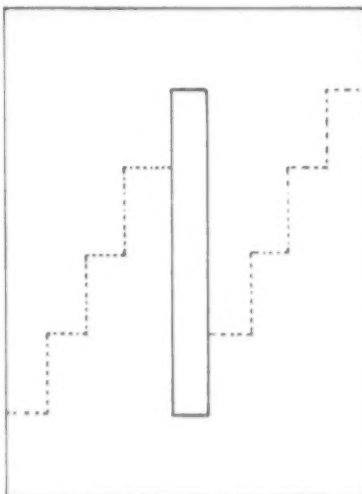
Thanks,

Cal Haught

We are indebted to *The Wolf Magazine of Letters* for steering us right on this matter.

Puzzlers

Everyone had a lot of fun with Mr. Hoover's carpet puzzler. Here's the solution. Cut along dotted line.



... and the winners: Alan K. Henry, Carl E. Postel, Foster R. Pericola, G. J. Campbell, Paul A. Tackett, Dr. W. B. Retallick, Thomas Sestak, W. H. Stewart, H. C. Husser, J. P. De Maio, Jr., Miss Jessie Thornton, W. W. Webber, Eugene Kozij, M. Conklin, H. Webb, G. Billings, W. Crownfield, Charlsie, C. McKinley.

now you can
produce
trouble-free,

FREE-
MACHINING
STEEL
with
FOOTE
MANGANESE
SULPHIDE

This fume-free ladle additive increases quality and reduces the cost of producing high sulphur, free-machining steels . . . with these plus advantages:

1. improved hot rolling behavior
2. fewer surface defects
3. fewer diversions
4. lower conditioning costs
5. low carbon content saves heat time

TYPICAL ANALYSIS

Manganese	53%
Sulphur	32%
Carbon	.22%
Size: 1" x 5" lump	

write for further details!

Foote
MINERAL COMPANY

438 Eighteen W. Cheltenham Bldg.
Philadelphia 44, Pa.

This Photo is One-Third Actual Size...

**OF A COMPLETE VEELOS V-BELT INVENTORY
IN THE O, A, B AND C WIDTHS!**

Put an end to endless space and inventory problems. Four reels of Veeelos adjustable v-belt replace up to 316 different sizes of endless belts... and take up a space of only 16 inches square.

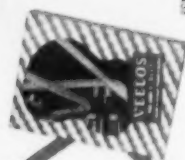
VEELOS
THE BALANCED
LINK V-BELT

Over 350 distributors throughout the country. Veeelos is known as VeeLink outside the United States.

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

WRITE FOR A FREE COPY... of the Veeelos Data Book. It's packed with valuable engineering data complete with illustrations. Send for your copy today.

MANHEIM MANUFACTURING & BELTING CO.
853 Manbel St., Manheim, Pa.



dates to remember

APRIL

SCIENTIFIC APPARATUS MAKERS ASSN.—Annual meeting, Apr. 24-28, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 29 N. Wacker Drive, Chicago.

ASSN. OF IRON & STEEL ENGINEERS—Spring conference, Apr. 25-27, Statler Hotel, Detroit. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

GRINDING WHEEL INSTITUTE—Spring meeting, Apr. 27-29, The Homestead, Hot Springs, W. Va. Institute headquarters are at 2130 Keith Bldg., Cleveland.

EXPOSITIONS

NATIONAL MATERIALS HANDLING EXPOSITION—May 16-20, International Amphitheatre, Chicago. Management: Clapp & Poliak, Inc., 341 Madison Ave., New York.

NATIONAL ASSN. OF PURCHASING AGENTS—Annual convention and inform-A-Show, May 29-June 1, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

BASIC MATERIALS EXPOSITION—May 31-June 3, Convention Hall, Philadelphia. Show management: Clapp & Poliak, Inc., 341 Madison Ave., New York.

RAIL STEEL BAR ASSN.—Annual meeting, Apr. 27-29, Grand Hotel, Point Clear, Ala. Association headquarters are at 38 S. Dearborn St., Chicago.

SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS—Spring meeting, Apr. 27-29, Hotel Statler, Los Angeles. Society headquarters are at Central Square Station, Cambridge, Mass.

AMERICAN ZINC INSTITUTE, INC.—Annual meeting, Apr. 28-29, Drake Hotel, Chicago. Institute headquarters are at 60 E. 42nd St., New York.

SOCIETY FOR ADVANCEMENT OF MANAGEMENT—AMERICAN SOCIETY OF MECHANICAL ENGINEERS—10th Anniversary methods conference, Apr. 28-29, Hotel Statler, New York. SAM headquarters are at 74 Fifth Ave., New York.

LEAD INDUSTRIES ASSN.—Annual meeting, Apr. 28-30, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

MAY

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS—National Meeting, May 1-4, The Shamrock Hotel, Houston, Texas. Institute headquarters are at 25 W. 45th St., New York.

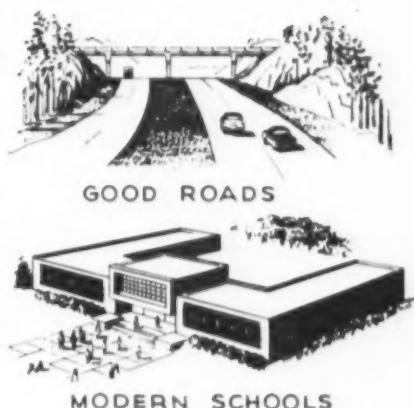
NATIONAL ASSN. OF CORROSION ENGINEERS—Regional Conference, May 9-11, Hotel Statler, New York. Association headquarters are at 1 Main St., Houston 2, Texas.

NATIONAL FEDERATION OF INDEPENDENT SCRAP YARD DEALERS, INC.—Open Forum and Dinner, May 15, Hotel Waldorf-Astoria, New York. Federation headquarters are at 29 Broadway, New York.

INDUSTRIAL HEATING EQUIPMENT ASSN., INC.—Spring meeting, May 15-18, The Homestead, Hot Springs, Va. Association headquarters are at 412 Fifth St., N. W. Washington, D. C.

A favorable "tax package"

with
economies
through
State
level
administration



—is one of the many advantages
of plant locations in progressive

NORTH CAROLINA

A "tax package" that is one of the most favorable in the Nation for a typical plant is provided by North Carolina, along with its many other advantages—such as abundant labor, accessibility to markets, mild Mid-South climate.

A true picture of this is obtained by considering the combination of State and local taxes.

North Carolina's business-like government supports good roads and progressive schools at the State level, including these vital services in the State tax schedule for stability and money-saving operation.

Local taxes, relieved of the costs of roads and schools, are low, yet sufficient to properly take care of local-level services.

The actual "tax package"—State and local combined—compares very favorably with any.

Testimony to satisfaction with this uniquely stable tax program and the high productivity of available labor is provided by the roster of well-known companies which have selected North Carolina for additional plants and expansions.

A copy of the "Summary of State and Local Taxes Payable by a Manufacturing Corporation in North Carolina" will be sent promptly upon request. Just write, wire or phone Ben E. Douglas, Director, Department of Conservation and Development, Raleigh 11, N. C.

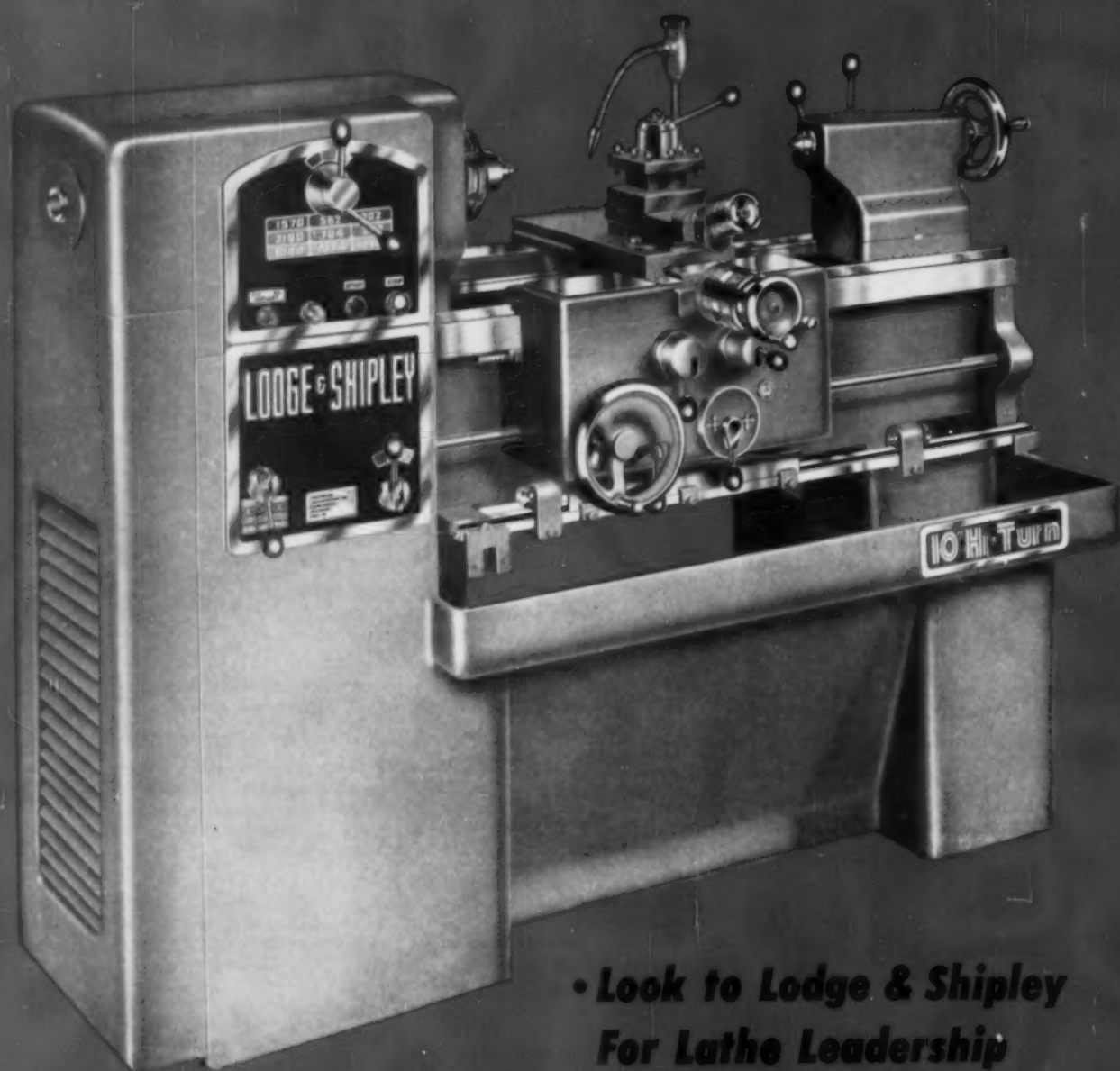
A handy brochure, covering many plant-location factors, is ready to mail—write for a copy.

Friendly North Carolina
Where Industry Prospers

NEW

LODGE & SHIPLEY

10^{1/2}"



**• Look to Lodge & Shipley
For Lathe Leadership**

*Above price is FOB CINCINNATI, OHIO and is
exclusive of applicable taxes customarily paid by
the buyer.

SEE IT NOW! and SEE IT AT THE MACHINE TOOL SHOW, SEPTEMBER 6-17

HI-TURN LATHE

A SMALL LATHE with FAMOUS LODGE & SHIPLEY QUALITY and ACCURACY

FULL 5 H.P.
3000 R. P. M.
HEAVY DUTY
GEARED HEAD

only
\$4,985*

including electrical equipment, ammeter, direct reading cross feed dial, dial for apron handwheel, pan, pump and tubing, and other items.

The Lodge & Shipley 10" HI-TURN Lathe is a completely new concept in lathes . . . new in size, design, utility and even in price—offering far more productivity for the dollar. It provides high speed turning, boring and facing capacity for production departments, where the use of a leadscrew is of no consequence.

Over a period of years, Lodge & Shipley research with lathe users of every type, established the fact that lathes used on a production basis rarely require leadscrews. Tailoring the 10" HI-TURN exactly to production requirements, Lodge & Shipley has eliminated the leadscrew and all its complicated gearing. The result is a rugged lathe of high accuracy, efficiency and productive capacity at a price substantially lower than conventional lathes.

Put the money-making 10" HI-TURN to work in your plant now! Like all Lodge & Shipley equipment, it's available on new deferred payment and lease plans. Write for Bulletin 300, The Lodge & Shipley Co., 3055 Colerain Avenue, Cincinnati 25, Ohio.

NEVER BEFORE...SO MANY FEATURES... SO MUCH QUALITY AT SUCH LOW COST!

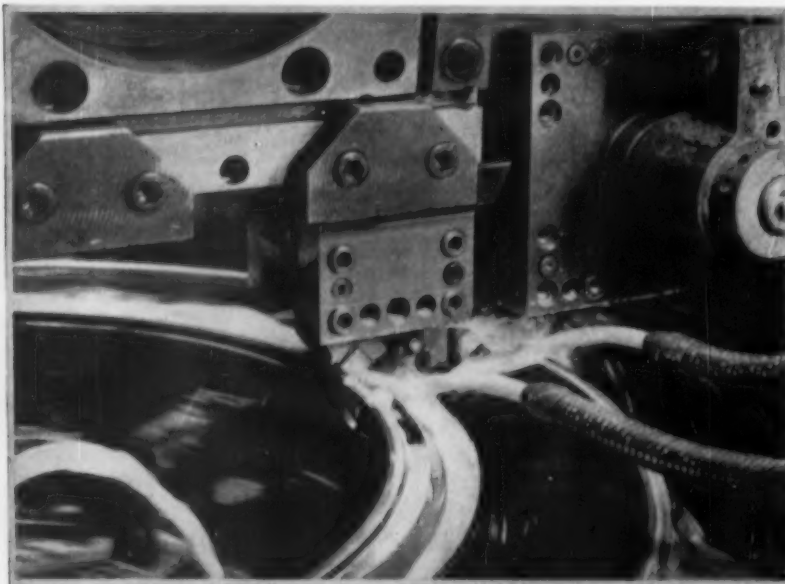
- Nine speeds up to 3000 RPM and 5 HP
- Built-in horsepower ammeter
- Color-coded speed and feed selection
- Totally-enclosed quick change gear box
- Dynamically braked motor in leg
- Template type, multiple length stops, magnetic clutch-operated
- 3 point floor mounting, requires no special foundation . . . easy to level
- Convenient, integral coolant system
- Chip pan effects easy chip removal
- Twist resistant elliptical girth bed
- Flame-hardened and ground replaceable steel bedways
- Hardened and ground cross slide ways
- Anti-friction bearings and trouble-free mechanized lubrication
- Direct reading cross and top slide dials
- 4-way tool block built into top slide
- Provision for rear tool block . . . multiple dovetail tool holders

Lodge & Shipley

your **LODGE-ical** choice

Industry-wide records prove that...
compared with other steel-cutting carbides...

Carboloy® Grades 350, 370 carbides increase production as much as $3\frac{2}{3}$ times



BEFORE CARBOLOY GRADE 370, 17 other carbides were tried by the Jet Division, Thompson Products, Inc., for facing 310 stainless-steel jet engine compressor frames. Best any carbide could do was 3 pieces per 8-hour shift. With Grade 370, production jumped to 14 pieces. Downtime losses were cut because Grade 370 inserts machined almost 3 times as many pieces per grind.

SETUP: Material—310 stainless steel. **Speed**—340 SFPM. **Feed**—0.008 inch. **Depth of cut**—0.100 inch at 36 rpm. **Coolant**—Yes.

BECAUSE THEY CUT MORE STEEL PER MINUTE, new Carboloy medium-duty Grade 350 and heavy-duty Grade 370 are drastically reducing metal-working costs in plants throughout the United States.

Reports from users prove that "350" and "370"—

1. Cut more cubic inches of steel per minute than any other carbides—increasing production as much as $3\frac{2}{3}$ times
2. Assure longer tool life
3. Decrease downtime

4. Provide wear resistance and extreme toughness never before experienced
5. Operate at temperatures as high as 1800° F. without tip deformation.

Because of these benefits, and their ability to operate at unusual feeds and speeds, Grades 350 and 370 enable you to obtain optimum results from your machine tools.

The performance of these two carbides is a standing challenge to all operating management of metal-working plants. For it shows the way to increased production and lower costs in metal-cutting operations—*now*. Write for case histories of in-plant operations.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11153 E. 8 Mile Street, Detroit 32, Michigan

Carboloy Created-Metals for Industrial Progress

Production Pointers

from

GISHOLT



TIME-
SAVING
IDEAS



Presented as a service to production men, we hope some of these interesting ideas, chosen from thousands of jobs, will suggest ways to help cut time and costs in your own work.

GISHOLT JETRACER SIMPLIFIES CONTOUR BORING OPERATIONS

Low-cost Unit Added to Late Model Saddle Type Turret Lathe

How to get still more production and lower costs out of present equipment? Mission Manufacturing Company, Houston, Texas, can show you a good example in the machining of steel valve bodies.

The time and money saver is a hydraulic tracer unit, added to a Gisholt 3L Saddle Type Turret Lathe. Operation of the turret-mounted

JETRACER is simple. The entire unit, including template, is self-contained and mounted on a single face of the hexagon turret. This in no way restricts use of the overhead pilot bar.

With the Gisholt JETRACER, production has been increased 25%. A low-cost, standard, single-point tool replaces expensive special sizing tools. Considerable time is saved on

gauging, since only one diameter needs to be checked. Uniform quality is an added advantage automatically achieved, because the chance for human errors is done away with in boring operations.

New ideas pay off handsomely: Increased output plus repetitive accuracy in difficult boring operations result from this turret-mounted Gisholt JETRACER.



◀ Note template and stylus which follows contour for boring operation.

Typical workpieces, rough and finished, handled in this setup. ▼





TIME-
SAVING
IDEAS

MODERN MACHINE TOOLS AREN'T AN

WAVE FACES EASILY GENERATED WITH THIS SLIDING TOOL BLOCK SETUP

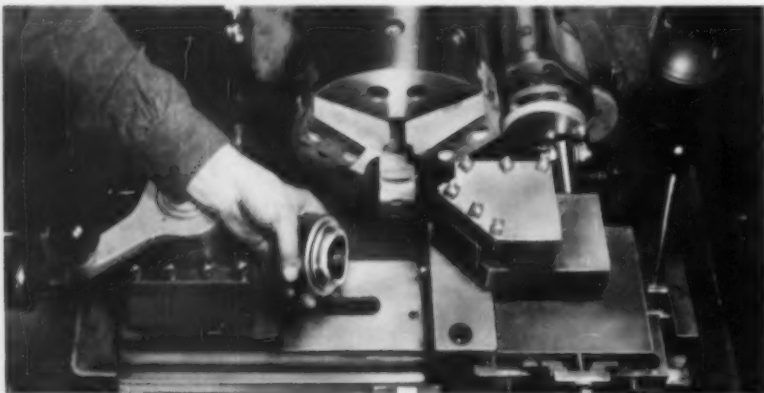


Simple Solution to Unusual Job on a Ram Type Turret Lathe

Talk about tricky shapes to generate, look at this lug insert forging. Yet it's easily done with this setup on a Gisholt No. 5 Ram Type Turret Lathe.

For chucking there is a spring-loaded locator in the spindle for correct radial location on the rib on the back of the part. Tools on the hexagon turret drill, bore, co-bore, rough turn, undercut and chamfer.

This close-up shows sliding tool block arrangement on the No. 5 Ram Type Turret Lathe.



The problem surfaces are generated by tools in a special sliding tool block on the rear of the cross-slide. The block is actuated by a cam which rotates in time with the spindle. A spring-loaded roller attached to the sliding tool block follows the contour of the face of the cam, causing tools to perform contour machining on the workpiece.

Expert tooling with sliding tool block arrangement and the use of the right machine give a low 4.3-minute f. t. f. time including this unusual facing job.

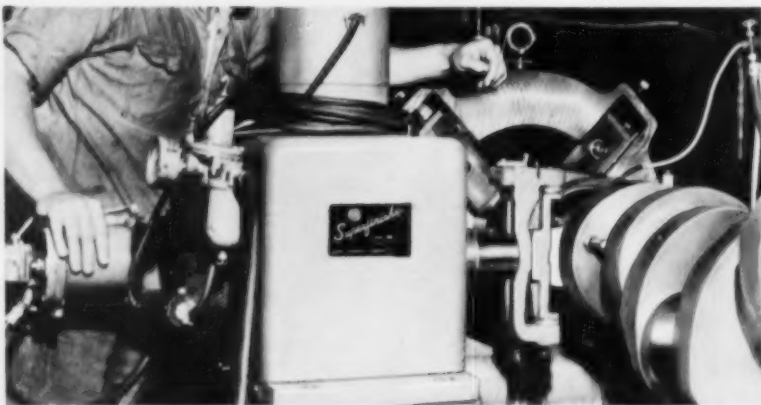
LARGE CRANKSHAFTS SUPERFINISHED WITH LOW-COST LATHE ATTACHMENT

Better Wearing Surfaces Achieved Without Adding Extra Operation

To get the longer bearing life demanded of crankshafts in today's higher speed diesel engines, this manufacturer uses Superfinish...and at a minimum of equipment cost.

The main and crankpin bearings are turned on a lathe to .001-inch tolerance. Then, without removing the crankshaft from the lathe, a Gisholt No. 4 Superfinishing Attachment, which has been substituted for the front tool post, is used to Superfinish these vital surfaces down to 10 micro-inches RMS. The required micro-inch surface finish is produced without an intermediate grinding operation.

You can see the savings in time and equipment by this setup. The quick Superfinishing operation exposes true base metal so that the crankshaft operates on harder, smoother bearing surfaces for a longer trouble-free service life.



With Superfinisher attachment mounted on the lathe, machining and Superfinishing jobs are done in one chucking.

Finer bearing surfaces and improved geometry by Superfinishing make these crankshafts better performing—at less cost than former finishing methods.

Helpful Catalog, recently printed, gives explanation of Superfinish and shows many applications. Write for your copy.

Your New Machine Tools— Cash?... On Time?... Lease?

What's the most practical way for you to obtain new machine tools? You have a choice of several plans... all clearly explained and illustrated with examples in this new bulletin. Ask for your copy of Form P-1173, "What You Should Know About Buying and Renting Machine Tools."



LOOK AHEAD... KEEP AHEAD... WITH GISHOLT



TIME-
SAVING
IDEAS

HOW BRAKE DRUM OUTPUT WAS INCREASED 50%

Precision Taper Boring Extra Benefit of Fastermatic Automatic Turret Lathe

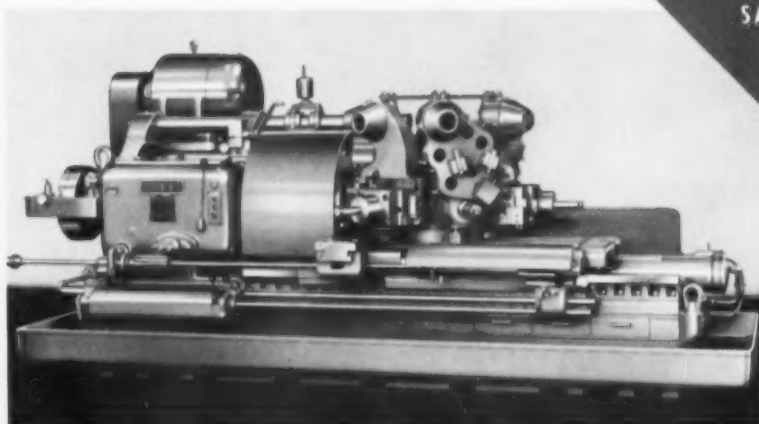
Greater output and greater precision were the objectives when refiguring this job...machining road grader brake drums.

The job is now handled on a Gisholt 4F Fastermatic Automatic Turret Lathe. This is equipped with special jaws to compensate for uneven chucking surfaces and hold the drum rigidly for the multiple cuts.

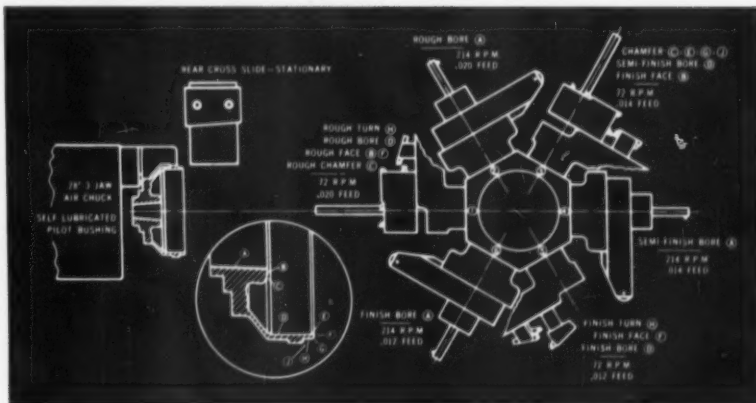
Taper boring (A) is done with a boring bar and cutter mounted in a turret facing slide tool. Three of these slide tools are used with a special cam block mounted on the stationary rear cross-slide which guides the spring-loaded slide tools along the taper angle of the bore. Result is precision gauge fit every time. These slide tools are alternated on the turret with other standard tools which bore, face, chamfer, and turn other sections of the drum.

The large parts are completed in 23.1 minutes—a 50% reduction in f.t.f. time of the former method.

The Fastermatic has the right combination of rigidity, accuracy and automatic features to provide important time- and labor-savings on this job.



Gisholt 4F Fastermatic Automatic Turret Lathe



EASIER CALIBRATION SPEEDS BALANCING OPERATION

Amount of Required Correction Directly Indicated on Gisholt DYNETRIC Balancers

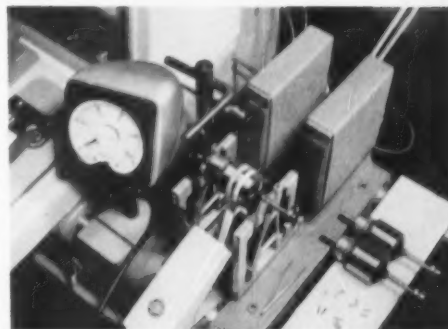
Production balancing of universal motor armatures is generally at a rate of 125 parts per hour, including measurement, correction and inspection. Fast, accurate, easy-to-operate equipment is a necessity.

This manufacturer uses a Gisholt OSB Bench Balancer to dynamically balance every armature. Six different sizes of extruded aluminum strip are used to correct for balance. The direct reading amount meter, calibrated so that one unit represents the smallest strip, quickly indicates which of the

six sizes must be used to produce balance.

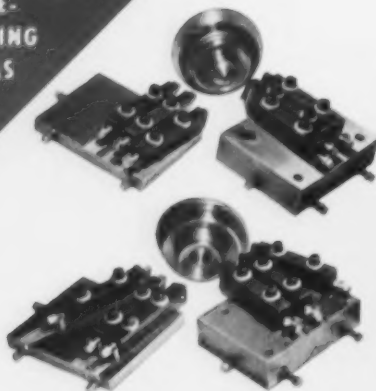
It takes only 15 seconds in this case to determine accurately which strips are to be used and the positions in which they are to be placed at each end of the armature. Can you imagine anything easier?

Gisholt Balancing Machines offer many fine features which add up to quick, accurate, low-cost balancing operations. Ask for your copy of new general balancing catalog, No. 1109-A.





TIME-
SAVING
IDEAS



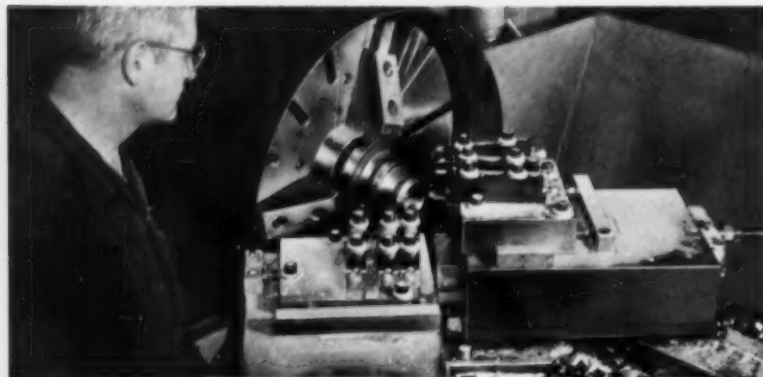
(Right) Tooling for one type cutter bit. Photos above show pre-set tooling for two other types.

Here three different types of steel oil well cutter bits, each in two sizes, must be handled. Good reason for carefully planning changeover.

The solution is nicely provided by a Gisholt Simplimatic Lathe and pre-

TIP FOR FAST CHANGEOVERS... PRE-SET TOOLING LIKE THIS

*How a little extra planning saves a lot of money
—with the Gisholt Simplimatic Automatic Lathe*



set tooling. Each type of cutter bit has its own tooling which is set before being mounted on the tool slides. Special tool bits are bolted in milled slots on steel spacer plates. These are then mounted on the slides. The Simplimatic's front and rear slides

have swivel bases to facilitate correct angular adjustment. Time for workpieces shown in photos is only 2.40 minutes.

Changeover with pre-set tooling on the Simplimatic saves time in handling these six different workpieces.

SPECIAL TOOLING COMBINES TWO OPERATIONS IN ONE CHUCKING



Headstock-mounted slide feeds tool at 45 degree angle to form grinding relief. (tailstock retracted to show tooling)

Rough and finished workpieces showing surfaces machined in this operation

No. 12 Hydraulic Lathe Uses Auxiliary Slide to Form Grinding Relief

How to finish these steel turbine converter hub forgings in one chucking with a minimum of special tooling?

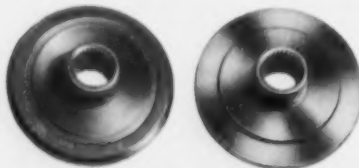
First, the work is chucked in the splined I.D. on a special splined mandrel, the end of which rotates slightly off-center to grip and drive the part. A tailstock provides additional support.

Tooling on the front carriage and rear independent slide finish turns the two hub diameters, finish faces

the flange and sizes the pilot diameter. Since the front carriage and rear slide are used for standard machining operations, they are not available for forming the grinding relief between the hub diameter and its adjacent face. Instead, a headstock-mounted auxiliary slide is used. Movement of the front carriage actuates this slide which feeds in at a 45 degree angle to form the grinding relief.

Floor to floor time is only .4 minute with the auxiliary slide permitting the part to be finished in one chucking.

An extra operation is saved by this relatively simple auxiliary slide arrangement on the No. 12 Hydraulic Automatic Lathe.



No. 3-455
635



THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT

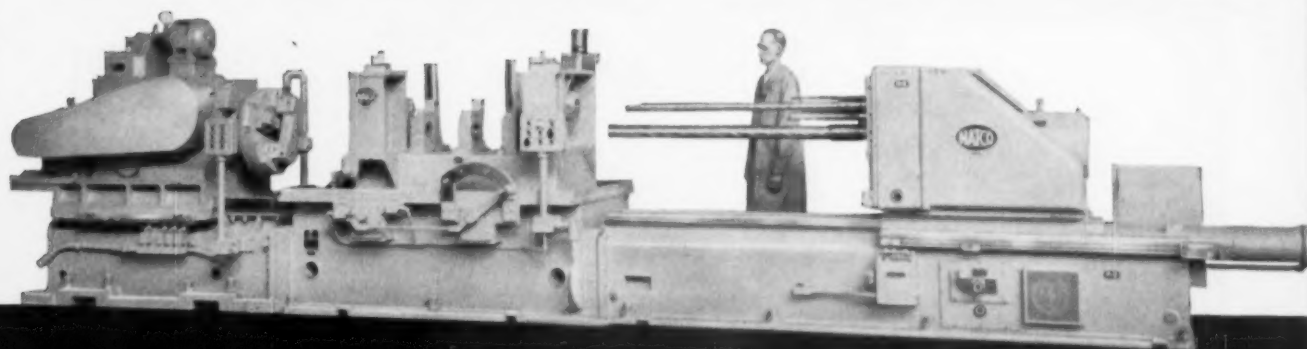
MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

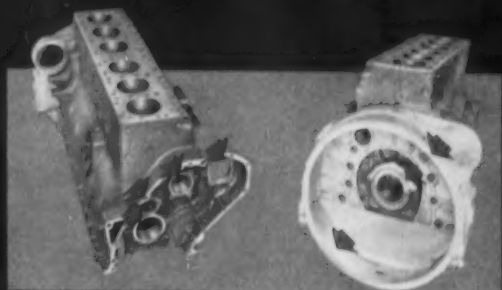
**NEW NATCO
BOREFACE**

SPEEDY, PRECISION PRODUCTION CUTS DIESEL ENGINE BLOCK COSTS



**CAM and CRANK FINISH BORING and FACING
OPERATIONS DONE SIMULTANEOUSLY ON
4.3 PARTS PER HOUR AT 85% EFFICIENCY!**

New NATCO BOREFACE machine, employing two heads, speeds production of diesel engine blocks by finish boring cam and crank holes and boring and cross-feed facing flywheel case simultaneously. The locations and diameters of the straight alignment bores are held to extremely close tolerances. The finished facing on the flywheel housing and cover is held square with the crankshaft bore to within .0025" total indicator reading. These tolerances are made possible by the built-in accuracy of the NATCO BOREFACE and because all operations are performed with one locating of the part.



RIGHT HAND HEAD OPERATIONS

Finish bore 7 (in-line) main bearings
Finish bore oil retainer and cover
Finish bore 4 (in-line) camshaft bearing inserts
Finish bore 2 holes

LEFT HAND HEAD OPERATIONS

Rough, semi-finish and finish bore and rough, semi-finish and finish cross-feed face flywheel housing and cover.



Call a Natco Field Engineer

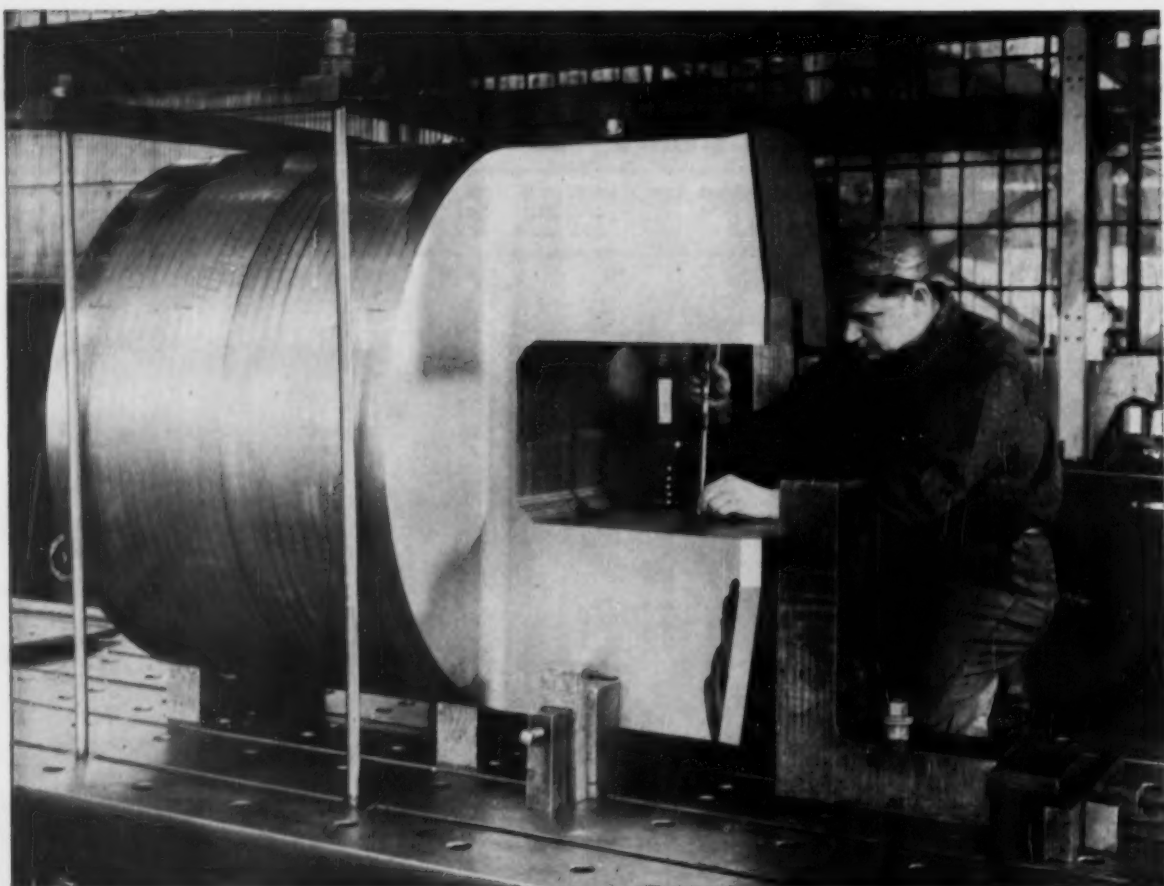
to help you solve your problems in
Drilling, Boring, Facing and Tapping



NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Indiana

Branch Offices

CHICAGO, Room 202, 6429 W. North Ave., Oak Park • DETROIT, 10138 W. McNichols Rd.
BUFFALO, 1807 Elmwood Ave. • NEW YORK, 35 Beechwood Ave., Mount Vernon

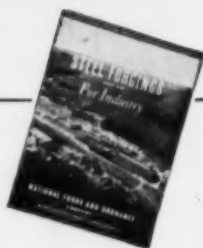


This Forging is made for really HEAVY DUTY-

Transmitting power under constant heavy vibration and sudden severe shock loads is the future in store for this giant mill coupling. It was National Forge as a double with its mating end from a single huge ingot. It is 40-50 carbon steel treated to 72,000 Min. tensile strength with 39,000 elastic limit. This forging and its adjoining coupling are 40" in diameter x 48-1/4" long and weigh 9,800 lbs. each. They are being machined to fractional inch tolerances to keep clearances at a minimum. This care in machining is extremely important to long operational life.

National Forge is equipped to turn out any steel to your exact analysis and finish machine to your exact specifications.

Whether your forging requirements are large or small, simple or intricate . . . try National Forge next time.



Send for your free copy of National Forge's New Bulletin explaining their Operations and Facilities.



NATIONAL FORGE AND ORDNANCE COMPANY

PRODUCES BETTER STEEL FORGINGS AND MACHINE WORK

IRVINE, WARREN COUNTY,
PENNSYLVANIA



Put life insurance on your forging dies!

The most critical period in the life of a forging die is its first few hours of use. Longer life is assured if adequate and proper lubrication is available during the break-in period.

Treat your dies with 'Aquadag'®—'dag' Colloidal Graphite in water—*before* they are used. This forms a microscopically thin and smooth film which assures necessary lubrication and reduces the need for operational lubricants. Also, it protects the surface against corrosion during storage prior to use. One forging plant increased die life 90% merely by pretreating its steel forging dies with 'Aquadag'.

Superior forging lubricants, either water-base or oil-base, can be prepared by adding a dispersion of 'dag' Colloidal Graphite to conventional die lubricants. 'dag' dispersions provide better parting, improved lubricity, and greater heat resistance; they also reduce lubricant costs, scrap losses, and die failure.

Write today for Acheson's free literature on forging lubricants. Ask for Bulletin No. 426-W2.

Dispersions of molybdenum disulfide are available in various carriers. We are also equipped to do custom dispersing of solids in a wide variety of carriers.

ACHESON COLLOIDS COMPANY
PORT HURON, MICHIGAN
...also ACHESON COLLOIDS LIMITED, LONDON, ENGLAND

*use 'dag' dry films for
trouble-free lubrication*





Wheel guard removed to reveal cutting action.

SLICE THROUGH METAL ...12 times faster



RUBBER BOND For wet cutting-off, with smooth, clean cuts free from burr or discoloration. Tolerances can be held within thousandths.

RESINOID BOND For dry cutting at high speeds. Rigid scientific controls during wheel manufacture insure perfect balance, running truth and straightness.

"CARBOFLEX" FIBRE-REINFORCED BOND For portable cutting and slotting, where severe side pressure and heat shock is encountered. Resilient construction gives cushion-like action and maximum safety.

FREE BOOKLET ON METALLIC CUTTING-OFF! Write to The Carborundum Company, Dept. IA 81-52, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ont.



THE MAN TO SEE IS YOUR CARBORUNDUM DISTRIBUTOR OR SALESMAN He's listed in the yellow pages of your phone book under "Abrasives" or "Grinding Wheels." Call him today—he'll show you how abrasive cut-off wheels by

CARBORUNDUM can give you more production at lower cost, whether you're slitting fountain-pen points or cutting heavy castings. He's ready to work with you on any cutting, grinding or finishing problem.



...with abrasive **CUT-OFF WHEELS**

Metallic cutting-off on a production basis, to extremely close tolerances...as well as accurate off-hand cutting with portable equipment, is possible *only* with abrasive cut-off wheels. CARBORUNDUM has developed precision cutting-off

wheels for every operation and every kind of metal...ferrous or non-ferrous, annealed or unannealed...rod and stock, thin or heavy-walled tubing, or sheet. **THE RIGHT WHEEL** on the correct machine will cut twelve or twenty times

faster than power hacksaws. And you eliminate the extra grinding and finishing operations usually required after shearing or flame-cutting. Bring *your* cutting-off operations up to date—use abrasive cut-off wheels by CARBORUNDUM.

CARBORUNDUM

REGISTERED TRADE MARK

...continually putting more **SENSE** *in your abrasive* **DOLLAR**

April 21, 1955

21

FLEXLOC AT WORK



MORE AND MORE FLEXLOC LOCKNUTS are being used on applications where dependable locking is essential to the operation of the equipment and the safety of the operator. This bundling chain with automatic lock provides positive grip and safe, sure bundle handling.

Two FLEXLOC Self-Locking Nuts hold this assembly together. Once the locking threads are fully engaged, the nuts won't work loose, regardless of the conditions under which they are used.

FLEXLOC one-piece, all-metal nuts are available in a full range of sizes in any quantity. Standard FLEXLOCs are stocked by leading industrial distributors everywhere. Write for Bulletin 866 and samples. STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

DO YOU KNOW? Standard FLEXLOCs smooth off rough bolt threads. The locking threads on all-metal FLEXLOCs are not chewed up when used on rough bolts.

Standard FLEXLOCs lock securely on bolts varying in diameter tolerances. The all-metal, resilient locking sections of the nut accommodate themselves to the diameter tolerances.

Standard FLEXLOCs are one piece, all metal. They are not affected by temperatures to 550°F. Nuts lacking these features have a more restricted temperature range.

Standard FLEXLOCs lock securely—stopped or seated—when $1\frac{1}{2}$ threads of a standard bolt are past the top of the nut.

Standard FLEXLOCs are not affected by moisture, oil, dirt or grit. They lock efficiently under all conditions, regardless of the vibration encountered.



FLEXLOC
LOCKNUT DIVISION

SPS
JENKINTOWN PENNSYLVANIA

THE IRON AGE

Vaughn

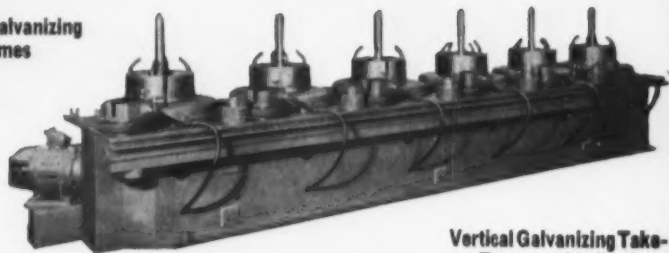
AUXILIARY EQUIPMENT

CORRECTLY DESIGNED—STURDILY BUILT
FOR EFFICIENT WIRE MILL SERVICE

TAKE-UP FRAMES

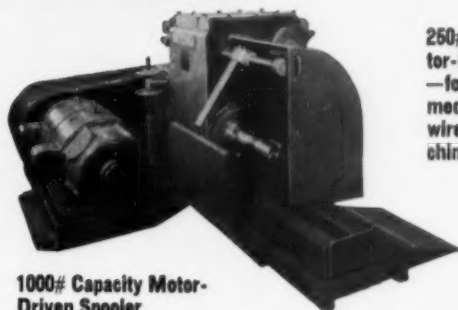


Horizontal Galvanizing
Take-up Frames



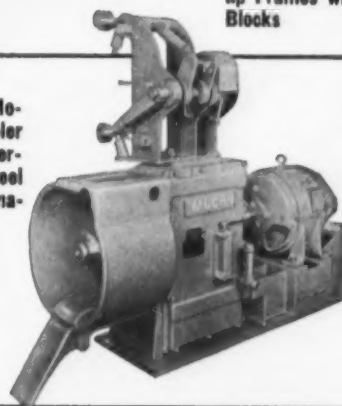
Vertical Galvanizing Take-
up Frames with Push-up
Blocks

SPOOLERS



1000# Capacity Motor-
Driven Spooler

250# Capacity Mo-
tor-Driven Spooler
—for use with inter-
mediate or fine steel
wire drawing ma-
chines



POINTERS and DIE STRINGERS

Extra-Heavy Four-
Roll Pointer for 1 1/4"
diameter low carbon
steel rod



No. 1 Continuous Pointer

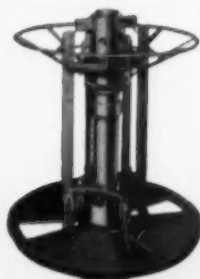


Die Stringer with Pointer

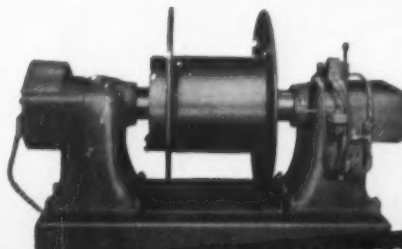


No. 1 Combination Die
Stringer & Power Pointer

PAY-OFF MACHINES



Riding Type
Block Strip-
ping Spider
used with
Pallet and
Pay-Off Ring
as a Pay-Off
Reel



4000# Capacity Pay-
Off Stand for pay-
ing off from large
spools



Quick on the Draw!

THE VAUGHN MACHINERY COMPANY
CUYAHOGA FALLS, OHIO, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT Continuous or Single Hole . . . for the Largest Bars
and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys



TOUGH!

Is your present abrasive tough enough to prove itself in performance? You can't judge an abrasive by looks, claims or promises. The only test of any abrasive is its *cost per ton of castings cleaned*. Because of exclusive metallurgical characteristics, Malleabrasive gives you the lowest cost per ton cleaned of any premium abrasive on the market! This has been proved in hundreds of production tests by users throughout the country. Prove it in your own production test. WE GUARANTEE THAT MALLEABRASIVE WILL GIVE YOU LOWEST COST PER TON OF CASTINGS CLEANED.

To order Malleabrasive, or for additional information on running a test, contact Globe Steel Abrasive Company, Mansfield, Ohio.

MALLEABRASIVE®

U. S. Patent #2184926 (other patents pending)



A section of the Woodward Governor Company plant in Rockford, Illinois showing a line of four P&W No. 2A End-Measure Jig Borers equipped with P&W Precision Tilting Rotary Tables.

**WOODWARD GOVERNOR
COMPANY USES**

PRATT & WHITNEY

END-MEASURE JIG BORERS

"... Pratt & Whitney was compared with other machine tools and found best suited to our needs."

Whether used for toolroom work or limited-run production, you'll find extreme accuracy, fast easy operation, dependability and low maintenance cost in P&W End-Measure Jig Borers.

The fundamentally correct P&W End-Measure System—basis for all others—uses precision end measures to obtain even inches and inside micrometers for inch fractions accurate to .0001"; every mechanic knows these instruments thoroughly. Built in "zero point" indicators provide a constant visual assurance of tenths accuracy.

The exclusive P&W Ball Roll Quill "roll feeds" on super-precision balls with a total pre-loaded bearing pressure of over 6000 pounds. This construction resists heavy lateral loads and retains initial high accuracy indefinitely without maintenance.

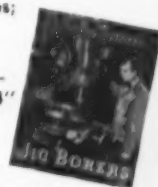


THE No. 2A—practical size for most shops;
table 22" x 44"

also THE No. 1 1/2B—compact and versa-
tile; table 12" x 24"

THE No. 3B—large, powerful;
table 24" x 54"

WRITE ON YOUR COMPANY LETTERHEAD FOR CIRCULAR 540-1



PRATT & WHITNEY

DIVISION NILES-BEMENT-POND COMPANY

WEST HARTFORD 1, CONNECTICUT, U.S.A.

BRANCH OFFICES . . . BIRMINGHAM • BOSTON • CHICAGO
CINCINNATI • CLEVELAND • DALLAS (The Stanco Co.)
DETROIT • HOUSTON (The Stanco Co.) • LOS ANGELES
NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER
SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., WEST HARTFORD

FIRST CHOICE FOR ACCURACY

SINCE



1860

MACHINE TOOLS • CUTTING TOOLS • GAGES

HOW TO BUY V-BELTS

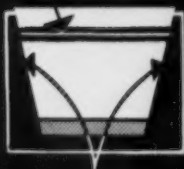
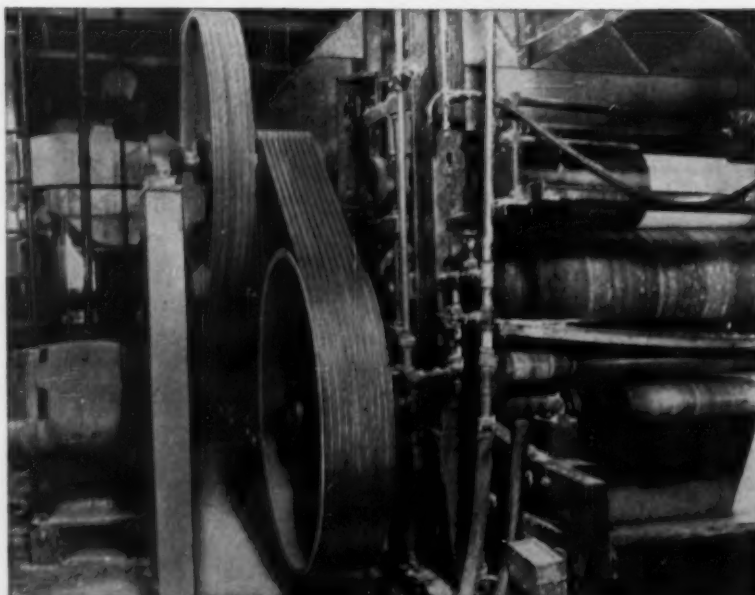
FOR TOUGH, RUGGED DRIVES

*... and get "More Use
per Dollar"*

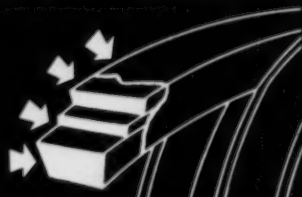
Look for a V-belt construction that provides longer life under shock loads ... extra strength with the use of the right synthetic strength member.

Precision balance of all parts of the V-belt makes for a smoother running drive, fewer matching problems ... and longer life for all belts on a multiple drive. Belt strength members of super-strength cords should be correctly positioned in the neutral axis section of the belt so as not to stretch or compress unnecessarily as the other parts of the belt are flexed in use. Straight belt sidewalls help support strength members in a straight line, permit all cords to pull equally ... deliver their full share of power. You get more grip, less slip because the belt presses tightly against the sheave grooves when rounding pulleys.

Specify by name the V-belt engineered to give you extra strength and extra pulling power ... specify R/M Super-Power V-Belts.



STRAIGHT SIDEWALLS
SUPPORT STRENGTH MEMBER



STRUCTURALLY BALANCED
FOR SMOOTH RUNNING

R/M SUPER-POWER V-BELTS

With these superior V-belts you get up to 40% more power capacity, or fewer belts can be used on the same drive, thanks to R/M's new synthetic super strength member. They provide greater elastic resistance to shock loads and permit virtually no stretch. R/M Super-Power V-Belts are oil-proof, non-spark, heat

resistant. You get the balanced combinations of features you need for more power on rugged multiple drives. Let an R/M representative show you how R/M Super-Power V-Belts, as well as Condor V-Belts, last longer on the job ... give you "More Use per Dollar".

RM-512

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Flat Belts



V-Belts



Conveyor Belts



Hose



Roll Covering



Tank Lining



Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

They handle the job faster with
CINCINNATI Shears
at LITTLEFORDS...



Photos courtesy the Littleford Bros., Inc., Cincinnati, Ohio.

Shearing stainless steel for tanks in the Littleford Shops.

"Faster handling—with a high degree of accuracy", say Littleford Bros.

Simple, rapid and positive gauging, with the accurate shearing performance of these Cincinnati Shears—gives a clean cut, economical production, with long knife life and low maintenance.

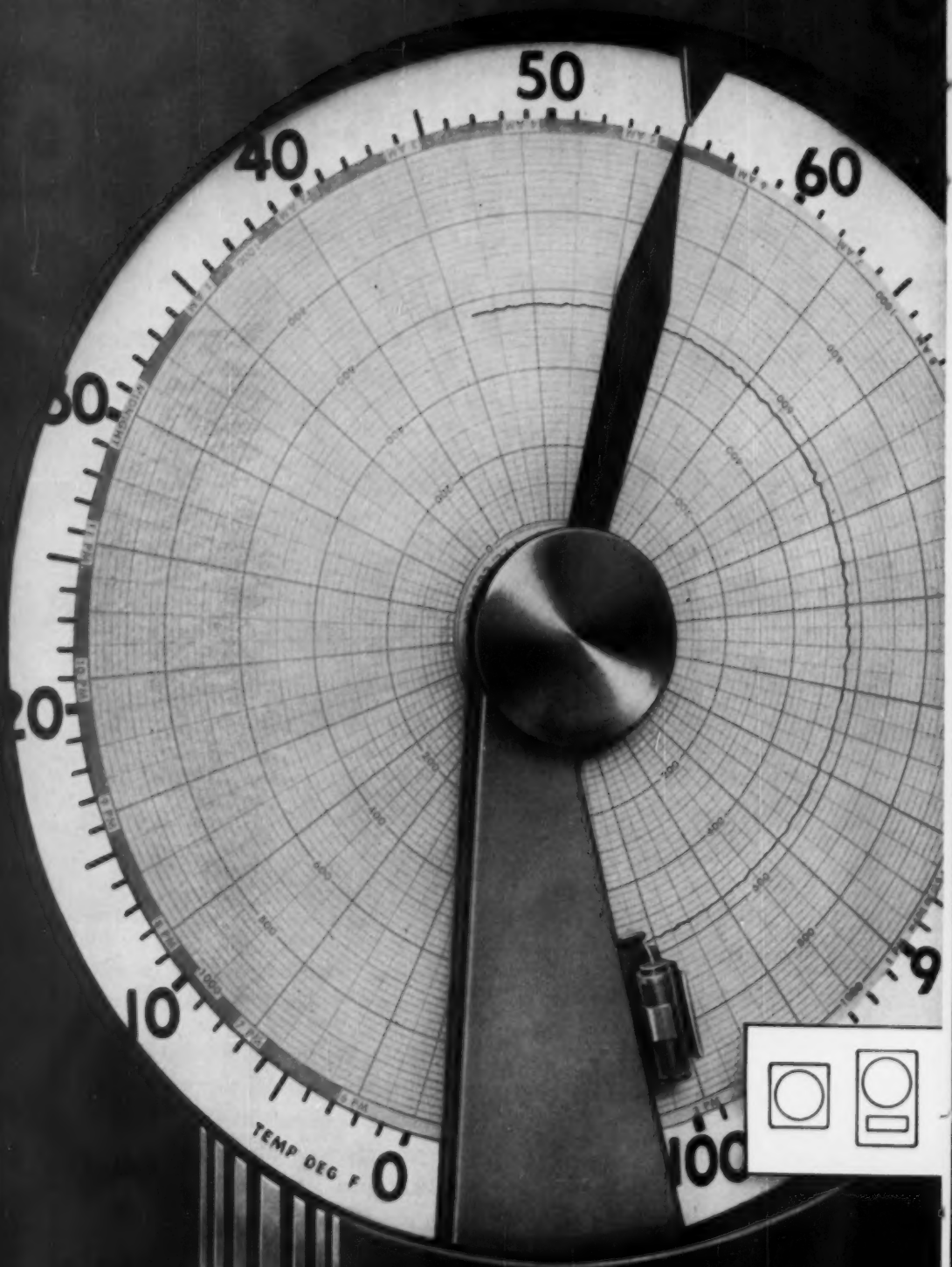
Write for Shear Catalog S-6.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



LEEDS



NORTHROP

Actual Size 11" x 12"

SPEEDOMAX® H

a new concept in instrumentation

Here's the new Speedomax H two-position recording controller. It is one of a complete line of electronic, null-balance potentiometer instruments that combines compactness with "big instrument" performance... outstanding simplicity of design with mechanical ruggedness. Speedomax H has design and construction features that result in multiple advantages unique in the field of industrial instrumentation.

Space-saver size—because of its efficient design. Its compactness permits substantial savings in panel space... two instruments can be mounted side by side in 24 inches.

Operating ease—is not sacrificed for size. Readability and "setability" of the Speedomax H illustrated are entirely comparable with that of conventional large size instruments.

Instrument adaptability—to any temperature control problem. Available as an indicator, or round or strip chart recorder, with any selected control an integral part of the instrument.

On-the-job economy—in initial cost, in ease of installation and during year-in year-out service. The outstanding design simplicity and mechanical ruggedness of all parts meet L&N quality standards for continuous, trouble-free performance.

Streamlined production—from the simplest indicator to the most complete standard controller. The instruments you want are delivered when you want them because they are assembled from ingeniously designed, in-stock components, producing savings in point-of-application cost to you.



A complete line: Indicator, recorder, controller... round or strip chart... two-position or proportioning control.

To see for yourself, the features of Speedomax H, get our pictorial fold-out which takes you inside the instrument. Just phone our nearest office or write us at 4956 Stenton Ave., Phila. 44, Pa. and ask for Die-Out ND46(1).

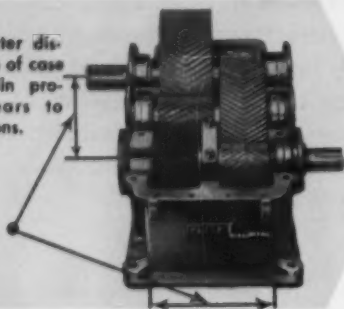


LEEDS  **NORTHROP**
instruments automatic controls • furnaces

3 BIG REASONS

WHY IT PAYS TO SEE FARREL® WITH YOUR SPEED REDUCTION PROBLEM

Relation of center distance and width of case gives latitude in proportioning gears to specific conditions.



1 DESIGN FLEXIBILITY

You can ask for—and get—a Farrel speed reducing unit that will fit your requirements exactly. Gears and pinions can be proportioned to meet specific load, speed and service requirements. Input and output shafts can be varied in size, in material and in extension. Housing dimensions can even be changed to meet problems in mounting.

2 PRECISION GEARS

Precision generation by the famous Farrel-Sykes method assures accuracy of tooth spacing, tooth contour and helix angle, which pay off in smooth, quiet, uniform power flow. The herringbone design provides evenly distributed pressure over each tooth, from tip to working depth line. This reduces wear and maintains correct tooth action throughout a long gear life.

3 WIDE RANGE OF RATIOS AND CAPACITIES

Designs include single, double and multiple reduction units, speed-change units having two or more selective speeds, and drives to meet special requirements. Ratios of single reduction units range from $1\frac{1}{2}$:1 to 10:1. Double reduction units are available in a ratio range from 10:1 to 60:1.

For more about these adaptable units write for Bulletin 449.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

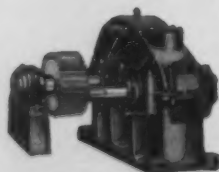
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Fayetteville (N.C.), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-958

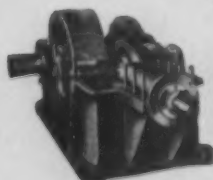
Farrel-Birmingham®



Heavy duty single reduction unit.



Unit with pinion on extended shaft.



Horizontal right angle unit.



Standard double reduction unit.



Stainless Steel bulb for color television tube by I-T-E Circuit Breaker Co., Philadelphia, Pa.



Spinning Stainless Steel circles into cone.



Forming cone on 500-ton hydraulic press.

How Stainless Steel helps I-T-E put color into television

Television is opening up a whole, wide wonderful world of color and Stainless Steel is playing an important part in this great advancement. I-T-E Circuit Breaker Company is manufacturing the bulb assembly for color television using cones made from Stainless Steel.

The advantages lie in the light weight made possible by metal shell construction—a highly important consideration at this stage of color tube development—the safety factor of a metal-glass tube and the ability to use a higher-quality glass in the picture surface. Stainless Steel's coefficient of thermal expansion makes it a suitable material for a metal-glass bond.

I-T-E's choice of Stainless Type 430 for its color TV development was a

natural as they have produced millions of Stainless Type 430 cones for black and white picture tubes ranging from 8½" diameter sizes to 27" rectangulars.

Stainless Steel's unique combination of properties merits consideration in all types of design problems. And it's not a difficult material to fabricate. Investigate Stainless Steel for your products, and when you do, be sure to use service-tested USS Stainless Steel.

FABRICATING FACTS

For the bulb circles of USS Stainless Steel .125" thick are used. Circles are shear formed on a spinning lathe to produce a cone 21" in diameter, tapering to 8" by 14" deep.

Cone is further formed on 500-ton press. Panel is sheared from funnel, flanges are formed and deburred and both parts sandblasted to receive glass.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS



SEE The United States Steel Hour.
It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL



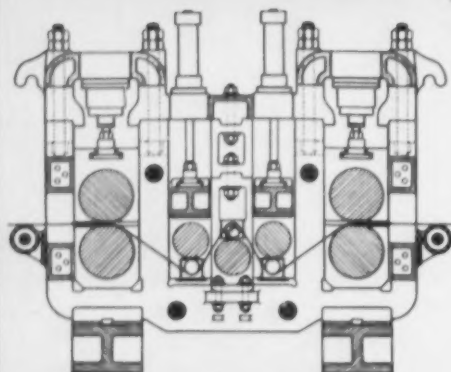
TRIPLE SCALE BREAKER

Speeds Pickling with the New

"YOUNGSTOWN"

High Speed Continuous Strip Pickling Line

...Better Pickling with Less Acid and Lower Cost!



See our new, pull thru type, TRIPLE SCALE BREAKER, —a revolutionary improvement that eliminates the need for a Pinch Roll Stand in a modern Pickling Line. Investigate this and other new "YF&M" advantages. Whatever your pickling requirements,—complete new lines, re-vamping of existing lines, new tanks, rubber-covered rolls, Paralloy pinch rolls, any pickling line equipment,—get the benefit of our 70 years' experience. Consult "Youngstown" on how to speed up your pickling, cut acid consumption and make your operation more profitable.

features—

- ▶ Cone Type Payoff with Strip Opener.
- ▶ Triple Processor with Roller Leveller.
- ▶ Flash Welding and Mechanical Stitching.
- ▶ Pull-Thru Type Triple Scale Breaker.
- ▶ Single Cycle Up-Cut Shears.
- ▶ Heavy Duty Rubber Covered, Brick Lined Steel Tanks.
- ▶ Magnetic Loop Control for Acid Tanks.
- ▶ Fume Exhaust System —Roto Clone Scrubber.
- ▶ Automatic Control for Temperature and Acid Proportioning.
- ▶ Side Trimmer with Scrap Cutting or Baling
- ▶ Up-Coiler with Strip Oiling System.
- ▶ Entry and Exit Coil Conveyors.



The Youngstown Foundry & Machine Co.

SERVING INDUSTRY SINCE 1885

Youngstown, Ohio



Wide range of models



NEW BRITAIN +GF+ COPY TURNING MACHINE

Changed over in minutes, using simple template, or prototype.

Created specifically for profitable copy turning and boring. Ask your New Britain representative for a showing of the color motion picture "A NEW APPROACH TO COPY TURNING" in your own plant. Or write The New Britain Machine Co., New Britain, Conn.

Economical for short or production runs.

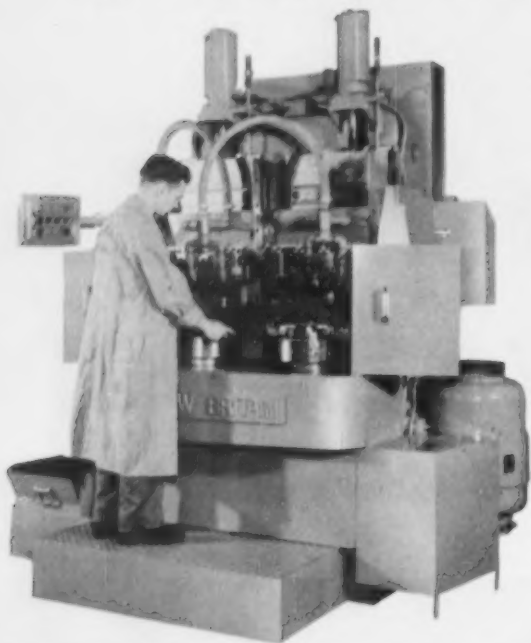
See the following four pages for other New Britain New's.





New Approach to Precision Boring

It's cam actuated • It's vertical • It's New Britain

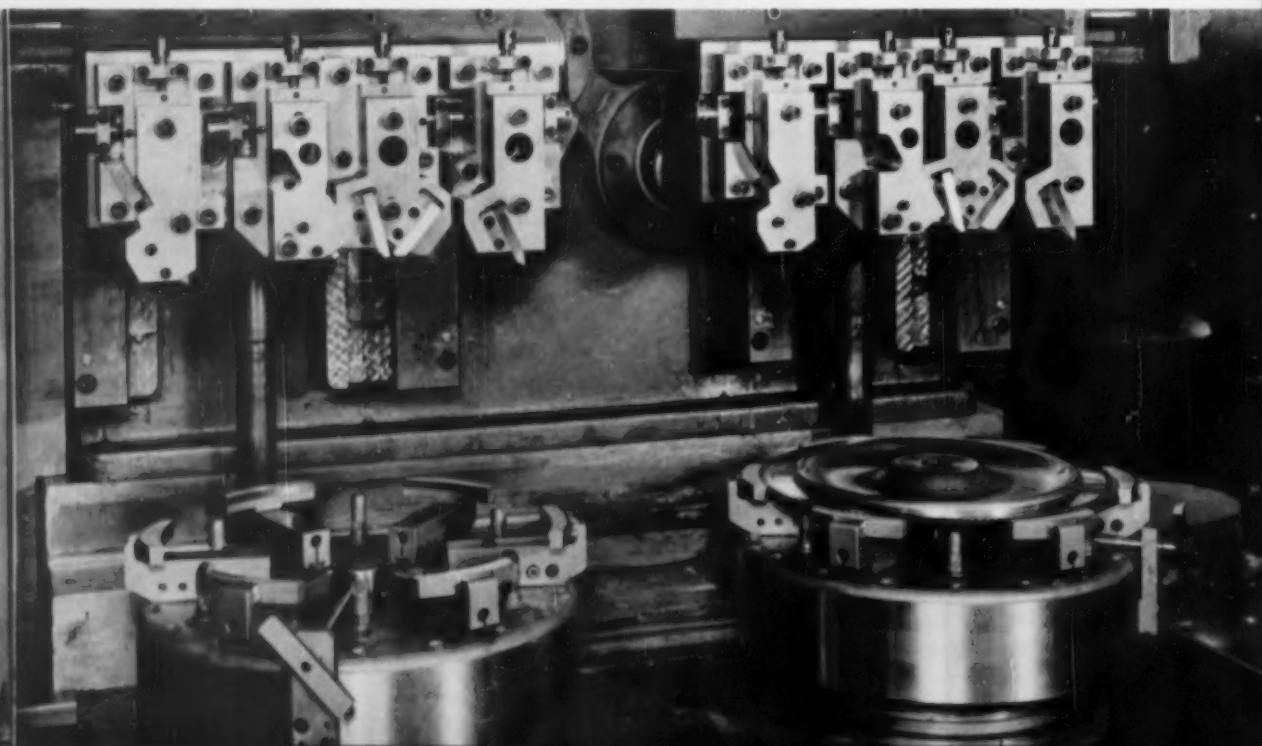


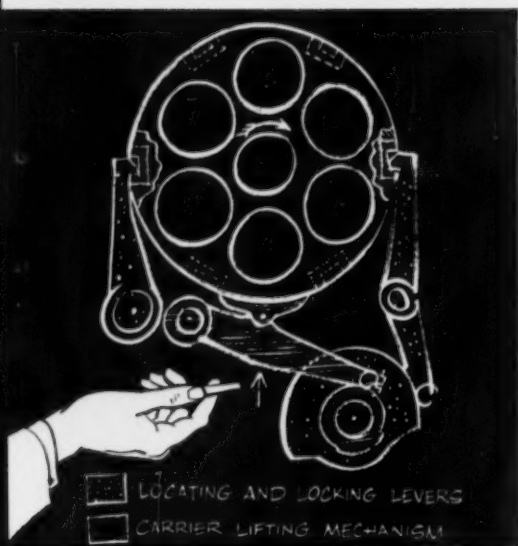
It extends the speed, accuracy and fine finish of precision straight and contour boring and turning to an even wider range of work.

New Britain's new vertical models feature accurate control of tool paths and cycle timing. This is the basic approach to precision boring employed in New Britain's famous single and double-end boring machines.

Shown below: a close-up of the tooling area of the Model 210 New Britain Vertical Precision Boring Machine at the top of the page.

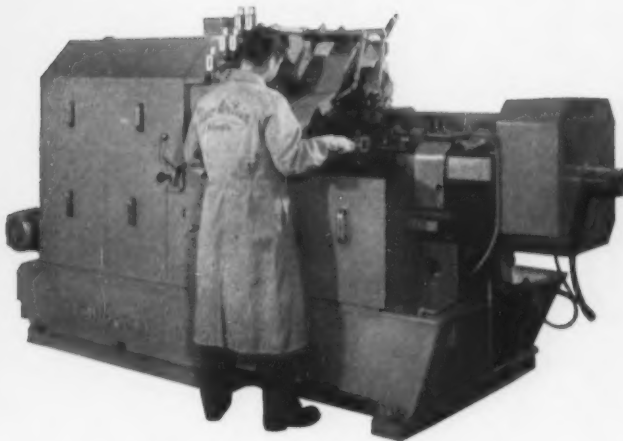
Two pieces are machined simultaneously by duplicate sets of tools. Left hand piece has been removed to show construction of chuck.





Even slight wear on the spindle carrier or its locating pads would destroy accurate alignment of end-working tools with center line of the spindle. Blackboard sketch shows how carrier is lifted during index, positively located and locked during cutting cycle.

Billions of indexes with absolutely no wear!



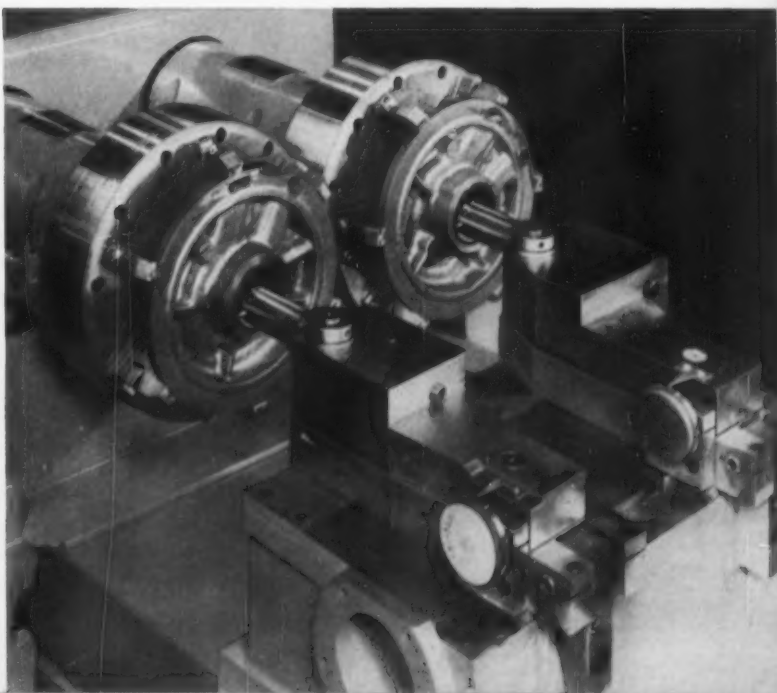
Experienced shop men say: *New Britain Chucks stay on the job and stay accurate.* That sums up the profitable end results of exclusive features like the one described at the left.

The secret of precision boring is constant close control of the tool

Successful precision boring and turning calls for control of tool paths and cycle timing, both with "gage makers' " accuracy. Precision ground cams insure this accuracy under all conditions on a New Britain. This hairline control, combined with ruggedness and stamina for *permanent* accuracy, produces fine finishes piece after piece, year in and year out.

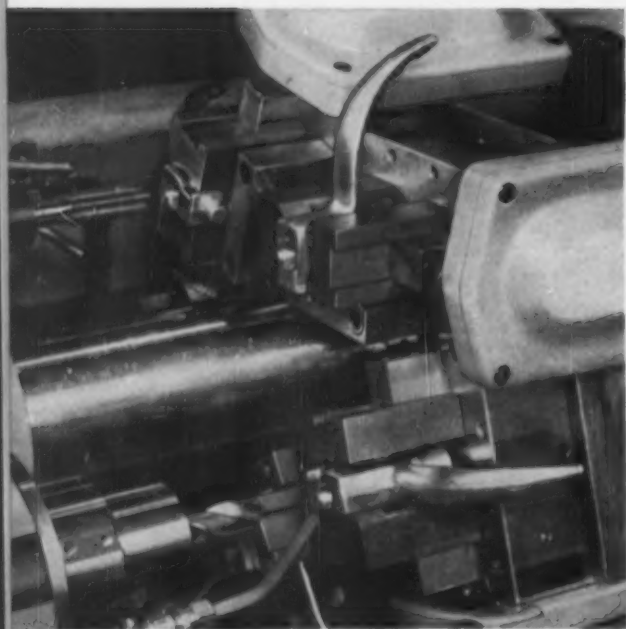


See the preceding two pages and the two following for other New Britain New's.





New New Britain Chucker will produce pieces as fast as operator can load them.



Irregularly shaped pieces — parts difficult to swing on a work-rotating chucker — pieces hard to produce at a profit, belong on the New Britain Model 23B.

This four-spindle chucker can machine up to 1290 pieces per hour (that's one every three seconds). A fifth, easily-operated, quick-acting chuck in the loading position minimizes idle time and operator fatigue.

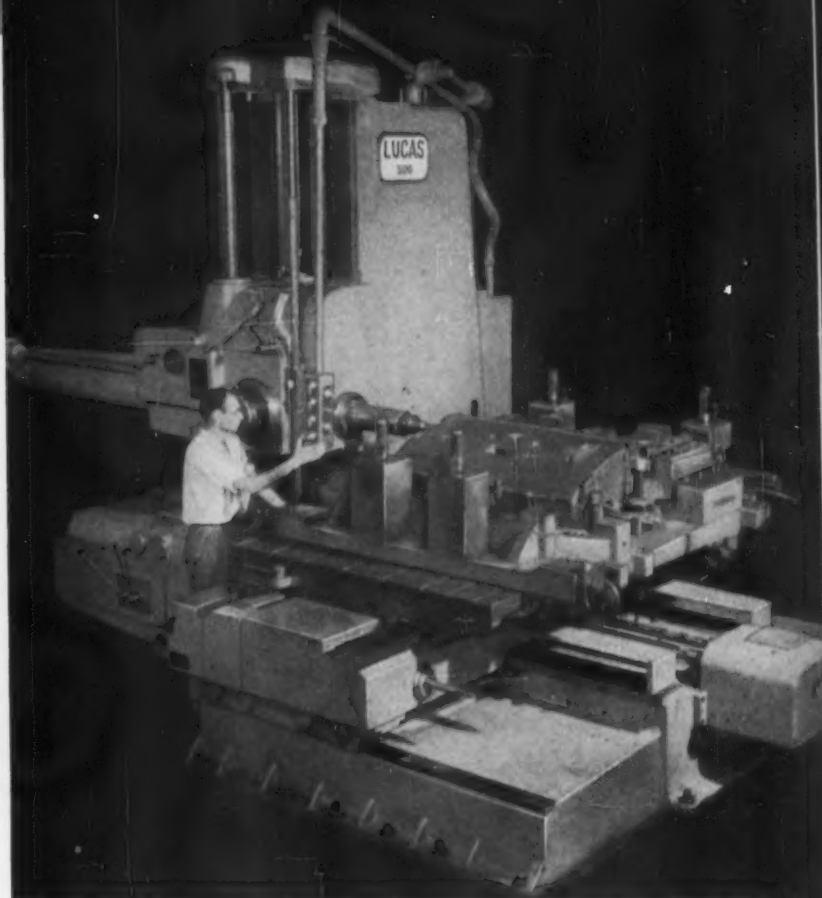
If you produce pieces that lend themselves to a tool rotating machine, New Britain Model 23B could become one of the most valuable machines in your shop. Check with the New Britain man or write for Catalog on Model 23B.



Model 61205 Lucas Precision Horizontal Boring Machine built for a large stamping plant, is used for reconditioning, altering and originating large die sections.

This short bed space-saving machine incorporates all the features of standard machines except a backrest for bar support. The 120" wide bed is of one piece construction for rigid table and saddle support.

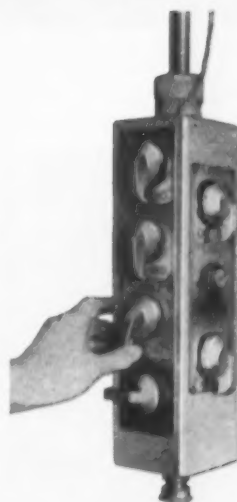
This machine is ideally suited to heavy die work which combines operations of boring, drilling and milling in both high and low speeds.



This Lucas will be YEARS AHEAD for a long time

Because Lucas applies its engineering skill to boring machines exclusively — because so many of the important improvements have originated at Lucas — because every new development is incorporated in the next lot built, *you get the latest first when you buy a Lucas.*

For example: Lucas, one of the first to develop pendant controls on the Horizontal Boring Machine, now offers a new, compact, lightweight control pendant with smooth operating multi-purpose directional switch levers. Or take Lucas Automatic Power Positioning, with built-in, pre-set positioning feed which positively repeats a series of operations without the use of jigs and fixtures. Read more about these features and many other points of Lucas leadership — write for the complete story in detail. Lucas Machine Division, The New Britain Machine Company, 12302 Kirby Avenue, Cleveland 8, Ohio.



• AUTOMATIC BAR and CHUCKING MACHINES • PRECISION BORING MACHINES
• LUCAS HORIZONTAL BORING, DRILLING and MILLING MACHINES • NEW BRITAIN +8F+ COPYING LATHES

The NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division, New Britain, Connecticut

Lucas Machine Division, Cleveland 8, Ohio

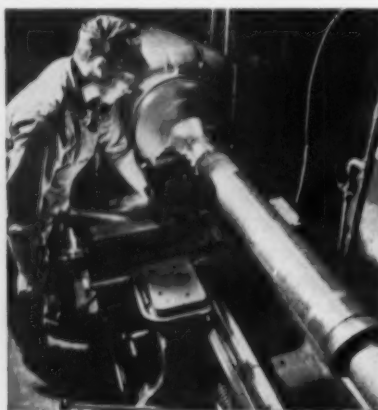
See the preceding four pages for other New Britain New's.



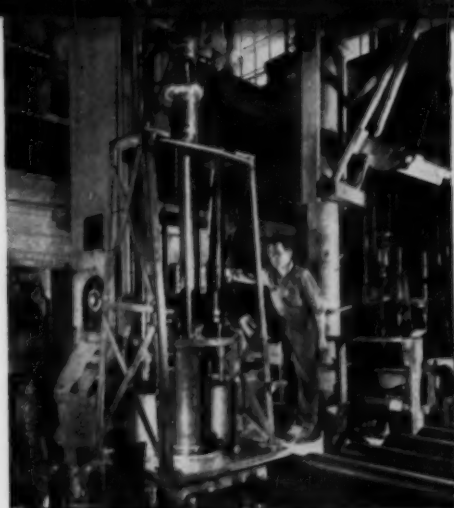
1. Welding The Main—Fittings and base plate are welded into the base of an oil hydraulic cylinder. The steel tubing must make a sound weld without warping.



2. Machining The Main—High speed threader (235 rpm) cuts close tolerance threads on the inside diameter for bronze packing nut and steel stop ring. Snug fit is essential to add strength to cylinder and prevent leakage under pressure.



3. Turning The Sleeve—The outside diameter of the sleeve is turned, and then ground to even finer finish. Straightness and concentricity in the tubing is most important. Proper stress-relief annealing of the steel prevents warping.



4. Honing The Sleeve—On this vertical honing machine, the inside of the sleeve (center) is finished to a 16 micro-inch finish for piston-ring fit to contain the hydraulic pressure when cylinder is operating.

How Strong Get

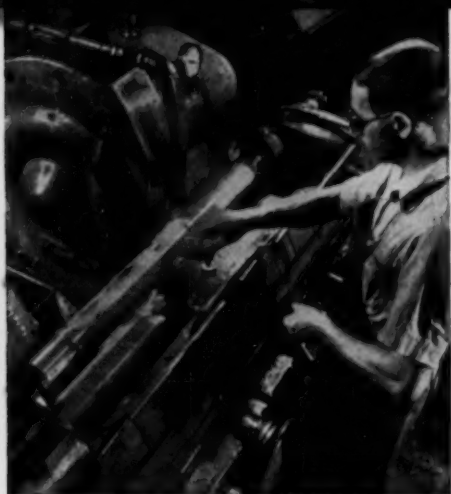
In order to increase production and reduce costs, all industry today is demanding greater performance from its tools. Equipment must carry heavier loads, lift them higher and faster—stay in service longer than ever before.

To accomplish this, strong, powerful arms of steel in the form of oil hydraulic cylinders are being used increasingly on industrial equipment, machinery, tractors, earth movers, loaders, lift trucks, portable drilling rigs. They transmit power smoothly, economically.

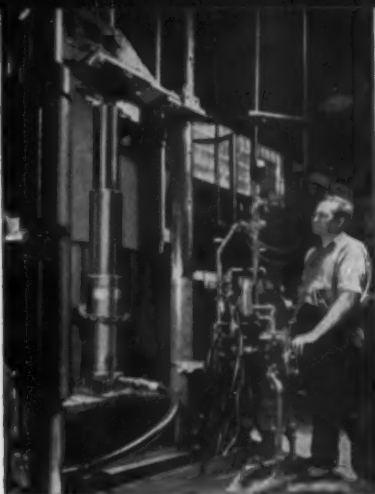
Among the producers of oil hydraulic cylinders, one of the largest and best known is the Commercial Shearing and Stamping Company of Youngstown, Ohio. It has developed precision methods of making heavy duty hydraulic cylinders that operate easily, yet contain the hydraulic pressures without leakage. To make them, Commercial starts with the best in cold drawn seamless mechanical tubing from experienced steelmakers such as Pittsburgh Steel Company.

• **One Example**—Take a look at the way Commercial produces just one of its many models: the two-sleeve telescopic cylinder used to erect the boom of a portable rotary drilling rig.

Each rig is equipped with two of



5. Grinding The Plunger—Here is a rigid test for any tubing. The plunger must be turned, ground, and polished to a mirror-like 16 mif with crocus cloth. The slightest imperfection would cause leakage under operating pressure.



6. 100-Per-Cent Inspection—Every cylinder made at Commercial is tested on equipment that develops the full pressure loads that are required under field operating conditions, and is thoroughly inspected during operation.



7. Raising A Rig—The double acting cylinders on this portable Franks rotary drilling rig develop an initial thrust of 35 tons in positioning the boom, and nearly 20 tons of pull when bringing it down. This is one example of the many models of oil hydraulic cylinders produced by Commercial.

Arms of Industry Their Muscles

these cylinders. They have a stroke of nearly 10 feet, providing an initial thrust of 35 tons. This lifts the boom from a horizontal folded position to a vertical extended position. To reverse the operation, the cylinder's double acting feature develops a thrust of nearly 20 tons on the pull stroke.

The tubular parts of each cylinder consist of a main, a sleeve, and a plunger. As the cylinder operates under oil hydraulic pressure up to 1,000 psi, the main provides the base for actuating the sleeve and plunger.

In production, these tubular parts are turned, ground and honed. Fittings are welded into position. Ends are threaded to hold packing nuts and stop rings. From start to finish, all operations require detailed scientific accuracy (see photos).

• **What It Takes**—You can readily see why the steel tubes for each cylinder must have special properties for this specific application.

Each tube must have uniform close dimensional accuracy, straightness, and concentricity, so that the amount of steel removed in turning, grinding and honing can be kept to a minimum. Extra time on these operations is expensive.

The steel must have machinability.

It can't be too soft or too hard. It must be clean in its chemical composition and clean on the surface. At the same time it has to weld easily. And it must take both machining and welding without warping. Finally, it must have extra strength for the variety of stresses that the load of raising, holding, and lowering the rotary drilling rig boom will place on it in field operations.

The mechanical seamless tubing supplied by Pittsburgh Steel for this cylinder ranges in size from 7.210 inches inside diameter with a wall thickness of .395 inches for the main, down to 3.250 inside diameter with a wall thickness of .313 inches for the plunger. It is a low carbon steel of inherent quality, cold drawn to exact

uniform size for easy machining and honing. It is stress-relief annealed to prevent warpage during manufacture. And it provides a tensile strength of over 60,000 psi.

• **What This Means To You**—Commercial uses Pittsburgh Steel's seamless mechanical tubing for this and many other types of cylinders because it can rely on excellent performance in production and high quality in the finished product.

If you have an application for seamless tubing, why not look into the opportunities Pittsburgh Steel can offer you? A phone call to the closest district office (see below) will bring prompt personal attention. Why not call today?

"Everything New But The Name"

Pittsburgh Steel Company

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DISTRICT SALES OFFICES: Atlanta • Chicago • Cleveland • Columbus • Dallas • Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Tulsa • Warren, Ohio. PLANTS: Monessen, Pa. • Allenport, Pa. • Akron • Los Angeles • Unionville, Conn. • Warren, Ohio • Worcester, Mass.



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(Advertisement)

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the quality ore
that constituted
the ...

FIRST

shipment
through the 'Soo'
in 1855



The New "Soo" Locks in 1955



The Old "Soo" Locks in 1855



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Sheared or Slit to Actual Working Dimensions

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As a Strip Steel User

**Just suppose, in 1954,
YOU had been our One
and ONLY Customer
for DSC Strip . . .**

• Taking the total tonnage we shipped as 100%, and based on our actual results for the full year—here's what your experience would have been like:

RETURNS AND ALLOWANCES 1.231%
ON THE JOB PERFORMANCE . . 98.769%

. . . In the course of the year, you'd have taken in millions of pounds of DSC STRIP . . . in just about every specification in the book . . . and out of it you'd have run a thousand-and-one different kinds of stampings and roll-formed jobs, from the simplest to the toughest.

. . . No . . . not every single pound of all these millions would have been perfect . . . as the record shows . . . But every pound in most of the individual shipments would have been exactly as ordered . . . and the same would have been true of nearly 99% of the aggregate tonnage shipped . . . That was in 1954, a year in which you probably gave every shipment "101%" inspection!

WHAT DOES IT PROVE?—That in the long run, DSC STRIP consistently meets or beats recognized standards for strip performance, when the tools, the job and the steel are properly mated.

How about putting us to the test?

Just call your nearest DSC Customer Representative.



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IN FURTHERANCE OF THE METAL STAMPING INDUSTRY

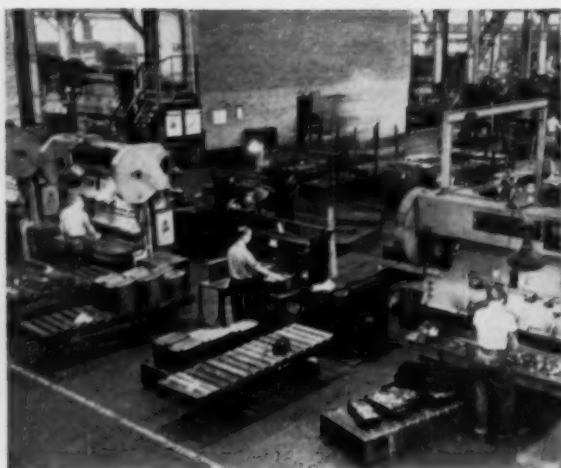


HOT OFF THE PRESS! Whether you make or buy your stampings, read this challenging, punch-packed booklet, "STAMPINGS—Make Them? or Buy Them?" by "Clem" Caditz, president, Northern Metal Products Co., Franklin Park, Illinois.

Order your copies today — 25c each, 6 for \$1 — from
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1 SHEARING—Berger shears operate from 40 to 60 strokes a minute. They will cut sheet steel up to 14' on the shortest dimensions, and medium-hard stock up to $\frac{3}{8}$ ". Operators above are shearing sheet steel that will be processed into boiler jackets for the United States Radiator Corp.



2 PUNCHING—Presses used for punching holes, knockouts and stamping small parts are strategically located throughout our plants. Some of them run at a rate of 108 strokes a minute, and their capacity runs up to 250 tons. The press at right above is stamping small parts for boiler jackets.

Republic can fabricate your sheet steel product ...FROM START TO FINISH

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You may not realize how many different products are made in Republic's Berger Division plants because many are fabricated for other manufacturers and marketed under their brand names. We will manufacture *your* product in volume runs—engineer, fabricate, finish, pack and ship, all to *your* specifications.

Some of our contract fabricated products are completely assembled units with operating mechanisms installed. Others are sheet metal assemblies that leave our plants finished with a prime coat, ready for final finishing, assembly and packing by our customer.

Our large stock of standard tools and dies and the specialized equipment of our Berger Plants are available to you. Often we can reduce costly tool-

ing investments because we already have the tools to do the job. Because you use our facilities, you can eliminate the overhead problems of building or expanding your plant.

Constant research and development at Berger have resulted in advanced processes and equipment to make your fabricated sheet steel products more attractive, and more economical. Furthermore, our facilities and fabricating experience provide you with the same high quality you see in our own products—lockers, office furniture, shelving and steel kitchens.

If you have a sketch or blueprint, send it along to us with complete specifications. We'll tell you promptly what Berger's specialized service can do for you. Learn more details in Bulletins 793 and 908.

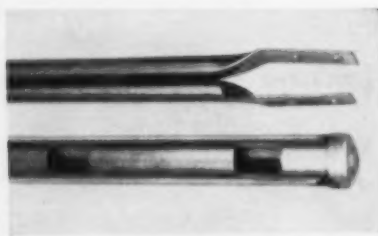
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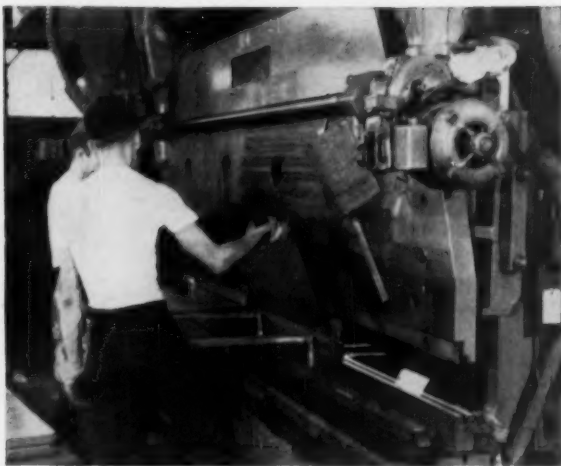
STAMPED AND DRAWN PARTS are produced for some of the nation's biggest manufacturers at Republic's Pressed Steel Division. Facilities include a complete tool and die department, welding and brazing equipment, a full line of stamping presses—plus double-action draw presses. Republic engineers will help you solve your stamping problems. Send coupon for details.



HEADED AND THREADED PARTS can be custom-made at Republic's Bolt and Nut Division—like this track pad nut for a leading tractor manufacturer. It was made at less cost than was formerly possible as a screw machine product. Producers of more than 8,000 special types of fasteners, we employ the very latest in modern tools and techniques. If you have a fastening problem, call us.



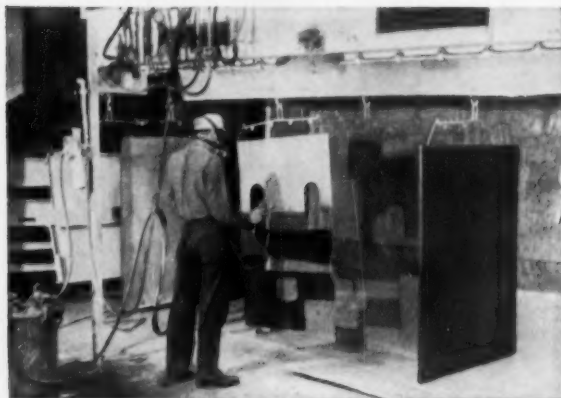
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3 FORMING—Brakes running at speeds up to a stroke a second range in capacity from 60 to 500 tons making possible production of a variety of items and gages simultaneously. Operators shown here are forming boiler jacket backs. The next stop will be the welding department.



4 WELDING—Berger's major plant facilities include the very latest welding equipment and techniques. For every requirement there's a specific unit properly located to do the best job most economically. Eighty-eight welding units are available in Plant No. 1. The operator above is spot welding stiffener channels to a boiler jacket top.



5 PAINTING—We're proud of these facilities. Our painting equipment will cover over 87,000 square feet of steel surface each hour. Mechanical bonderizers and degreasers clean the mill stock parts before painting. They are then conveyed through one or more of our 32 spray booths or six mechanical dip tanks and finally through one or more of our 40 baking ovens, emerging with a beautiful, lasting, baked-on finish. We'll match your sample for color. Above, the finisher is applying gray enamel to a boiler jacket top.



6 PACKING AND SHIPPING—Boiler jackets are shipped in cartons, knocked down. Carefully packaged these jackets are conveyor transported to inside rail or truck loading facilities. Packing equipment includes newest machines for crate making and automatic nailing. Beyond our doors, more advantages—you are shipping from centrally located Canton, Ohio.

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April 21, 1955

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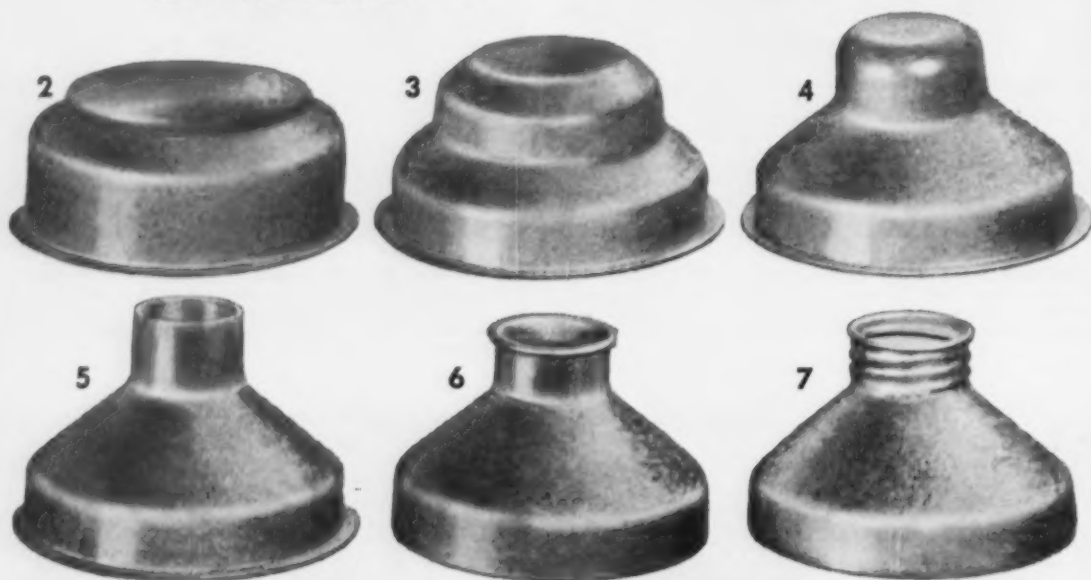
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OUR CHALLENGE

**Anything you can make
of steel sheets ...**



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...with the tightest zinc coating yet produced!

Here is a galvanized sheet with a tighter bond — tighter than any sheet yet produced. Manufactured by a new continuous galvanizing process, Wheeling **sofTITE** is vastly more ductile, more workable. Wheeling **sofTITE** enables you to perform the most difficult operations without the coating chipping, cracking, peeling or flaking!

This sprinkling can head, for instance, had to be electro-plated after fabrication. Now, using

Wheeling **sofTITE**, electro-plating is eliminated. **sofTITE**'s zinc coating remains smooth and unbroken even after these severe drawing operations.

If you've been having difficulty using customary galvanized sheets, try Wheeling **sofTITE**. So many users have called it the best galvanized sheet yet produced that Wheeling is tripling its production facilities in 1955. Wheeling Steel Corporation, Wheeling, West Virginia.

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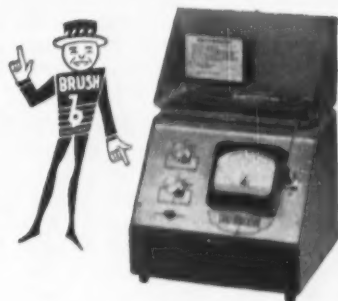
VARIETY OF SURFACE SPECIFICATIONS
USED BY DIFFERENT COMPANIES

	A	B	C	D	E	F	G	H
MICROINCHES								
0			1	10	VVV	C		
2			2	9	VTV	D		
4	b 1-20		3	8	VTV	E	POLISH FINISH	f ¹
8			4	7	VVV	F		f ²
16		GG	5	6	VVV	G		f ³
32	M 21-30	G	6	5	VV	H	SMOOTH TOOL FINISH	f ^{3½}
63	X 31-60 BY MACHINE	ff	7	4	VV	K		f ⁴
125		f	8	3		L		f ⁵
250			9	2		M	ROUGH FINISH	f ⁶
500		RG	10	1		N		f ^{6½}
1000						O		f ⁷

NEW ASA STANDARD ESTABLISHES UNIFORM PRACTICE FOR SPECIFYING AND MEASURING SURFACE FINISH

One uniform standard for specifying and measuring surface finish of machined parts now replaces a multitude of individual practices. This eliminates conflicting ideas and arguments, saves time, ends guesswork.

With the new ASA and MIL-10 Standards your engineers can now specify surface roughness and character of a surface, in the same terms as other plants, your suppliers and your customers. When you use the new industry-wide standard you'll save time and money!



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When you specify in accordance with the New Standard, you'll naturally want to make shop measurements in the same terms. The Brush Surfindicator is the only instrument which meets all the requirements and recommendations for surface finish (instrumentation). It's designed for shop use—highly accurate—easy to operate—portable and lightweight—and priced within the range of every shop! Send coupon for excerpts of the New Standard, and information on the SURFINDICATOR today!

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April 21, 1955

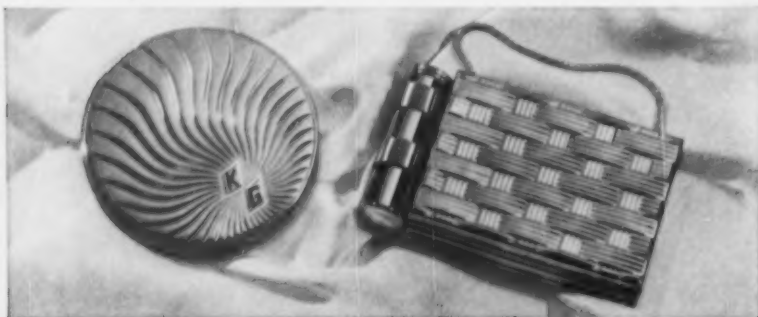
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BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

BRIDGEPORT
CO.

Reporting new developments in copper-base alloys and metalworking methods.



Bridgeport High I. Q. Brass gives rich gold color, high gloss finish to stylish vanity and lipstick cases. (Courtesy, Zell Products Corp., Norwalk, Conn.)

Beauty in Brass: A Story of the 4th Dimension

"Rich as gold," describes the deep warm color of Bridgeport 87 Brass. And, "polished as a mirror," describes the lustrous finish Zell Products Corp., Norwalk, Conn., gives to its line of vanity and lipstick cases. The success of this story belongs to the High I. Q. (Inner Quality) of Bridgeport brass strip, and the 4th Dimension, its optimum grain size.

The cases are made primarily by blanking, stamping and cupping thin strips of brass (Alloy 87); 87% copper, 13% zinc. Therefore, a certain amount of ductility is essential in the metal. The mirror-smooth polish is brought out by buffing, which calls for a fine grain size. The combination of these two qualities is a finely-balanced compromise to bring both properties to ideal working requirements.

Bridgeport supplies this exceptionally smooth metal, tailored to the customer's requirements— $\frac{1}{8}$ th hard and light anneal temper, with .015 mm grain size. Metal of this temper provides an extremely smooth surface after forming which may be buffed to a high gloss with a minimum of labor and time. It has an ideal combination of ductility and ability to take a high polish for a great many profitable applications.

Many other combinations are also available, each suited to a particular range of forming and buffing requirements. So ask your Bridgeport Technical Service representative to assist in your metal selection. Make sure of the 4th Dimension—the right grain size to meet both product needs and production methods, for no one fine-grain brass does all jobs well.

Bridgeport Phosphor Bronze Makes Tough, Long-Wearing Clutch Plates

Since 1929, the Rockford Clutch Division of Borg-Warner Corp., Rockford, Ill., has used Bridgeport Phosphor Bronze Grade A (Alloy 36) for clutch outer discs in their Pullmore Multiple-Disc Clutches. They have used this alloy consistently because of its outstanding strength and superior resistance to wear under severe operating conditions, another example of properties assured by the High I. Q. (Inner Quality) of Bridgeport alloys.

The alloy is supplied by Bridgeport in strip form, rolled to an extra spring temper of 9 B&S numbers hard, and having correct surface finish to meet specifications. Automatic machines stamp blank discs, $1\frac{1}{4}$ in. to $10\frac{1}{8}$ in.

in diameter, from three thicknesses of strip; .062 in., .092 in. and .125 in. Each is then pierced with a large hole for the clutch shaft and with a series of small holes around the working periphery of the clutch disc. They are then flattened, heat treated to 500°F. The small holes are impregnated with graphite to complete the part.

The clutches in which these discs perform are used on main drives, auxiliary controls, and power take-off mechanism to obtain forward and reverse movements, or high and low speeds. They serve as both clutch and brake, and therefore must be rugged.



Clutch discs of Bridgeport High I. Q. Phosphor Bronze have high strength and wear resistance in heavy-duty service. (Courtesy Rockford Clutch Division, Borg-Warner Corp.)

Composed of approximately 95% copper and 5% tin, Bridgeport Phosphor Bronze Grade A (Alloy 36) has high resistance to fatigue and wear from rubbing against other materials, excellent spring properties under repeated flexing, and greater resistance to corrosive attack than most brasses and copper.

This alloy is also recommended for use in metal bellows for temperature and pressure control instruments, clutch discs, bridge bearing plates, screens and beater bars in many of the process industries; snap switches, spring contacts and other parts for electrical and electronic equipment.

For even more severe service, Bridgeport Phosphor Bronze Grade C (Alloy 35), composed of 92% copper and 8% tin, would be the preferred alloy. High I. Q. metals are produced with Inner Qualities to meet the most rigorous specifications of the industry. (3138)



BRIDGEPORT BRASS
COMPANY ♦ BRIDGEPORT, CONNECTICUT

Mills at Bridgeport, Conn.,
Indianapolis, Ind., and Adrian, Mich.
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IDEALARC...GIVES YOU

BOTH AC and DC

WELDING CURRENT

NOW
DC Industrial Welder
for operation on single
phase power lines

NOW
Rectifier Welder
with both current and
voltage controls

NOW
Rectifier Welder
with arc-booster
starting

● One machine, Lincoln Idealarc, now gives you *both* AC and DC welding current. You have *both* current control and voltage control. For every job, you can now select the ideal arc... soft arc or forceful arc... AC or DC.

Shops which do not have 3 phase power can now use DC. Idealarc is the only DC welder to operate from single phase power available at reasonable prices in industrial sizes.

With dual arc control on DC, you have the same benefits of soft arc and forceful arc for welding with DC as with AC. Arc-booster starting on both AC and DC... on both soft arc and forceful arc... assures non-sticking, easy operation, speeds intermittent welding, gives full penetration at the start of each weld.

Idealarc cuts duplication of welding equipment... saves on welder cost. So why tie down your operations with one choice of welding current? Idealarc provides complete freedom to select the correct arc type and welding current for maximum speed, maximum ease and quality of welding... for the same investment.

SEND FOR FACTS

Send for Bulletin 1343
Shows how you can cut welding
costs... now. Write:



THE LINCOLN ELECTRIC COMPANY

DEPT. 1503, CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

Koppers rebuilds coke ovens from the ground up!

BESIDES BUILDING NEW COKE OVENS, Koppers specializes in prolonging the life of old ovens. Koppers does this by repairing them, or when necessary, by rebuilding them from the ground up.

In many cases, preventive maintenance by Koppers can head off major repairs. For example, it pays to straighten buckstays and renew jamb castings *before* the heating-wall brickwork has been seriously damaged.

However, even if a battery of coke ovens has reached the advanced stages of deterioration, it can be rehabilitated by Koppers so that it will enjoy many *extra* years of productive life. When Koppers repairs coke ovens, part of the battery can be kept in operation.

Our inspectors will be glad to examine your coke plant. Their report will be reviewed and evaluated by men who have been designing, building and repairing coke ovens for many years. Then, where necessary, recommendations for repair work will be made. Your inquiry is invited regarding this service.

Constructing, rebuilding or repairing coke ovens is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers.



*Engineering and
Construction Division*

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA



Battery of coke ovens being repaired by Koppers. Note bowed and distorted buckstays in background. Compare with new buckstays in foreground. Bench is also in the process of being repaired and straightened.

information memo

from the engineering laboratories of CONSOLIDATED VACUUM CORPORATION

CVC

Volume 1

Number 2

HIGH-VACUUM FURNACE DESIGN

The module concept

"Building blocks" give high-vacuum furnaces flexibility.

CVC engineers are using the module concept in the design of high-vacuum metallurgical furnaces. This involves the construction of a series of component assemblies which can be interworked to meet initial requirements as well as changing or expanding needs.

These "building blocks" solve one of the most important problems facing potential users of high-vacuum furnaces—the fear of tying up capital in equipment for today's needs which might not meet the market demands a few years hence.

Presented with a module design like the one described here, buyers can plan their installations to meet present requirements while allowing for economical expansion to fill greater or even different needs in the future.

A The basic design block

around which all variations are made is the center chamber section.

This basic portion of the furnace remains the same through all the variations provided by the different modules. The crucible-coil assembly is contained here. Since these vary in capacity depending on the nature of the application, the trunion supports of the center section are designed to accommodate the largest size. Thus, the user can increase the capacity of his melts simply by installing a larger crucible.

The **pumping system** is connected to this block through ports in the side of the chamber. There is room for one, two, or three of these ports depending on the pumping capacity desired. If a user requires only one pump in his initial operation, the other ports are blanked-off with steel plates which are easily cut out when additional pumping is needed.

B The chamber cover

contains the devices used in the control and inspection of the furnace contents.

The cover normally contains the alloying turret, bridge-breaking mechanism, a

sampler, and the opening or connections used for pyrometers and other instruments. All are located within easy access of the operator.

The chief merit of all these assemblies is the fact that they are conveniently located for easy maintenance, and such items as the alloy-turret, and sampler, can be removed for servicing or cleaning *without disturbing the pressure within the chamber*. Valves and connections with the main pumping system make this possible.

C Different chamber bottoms

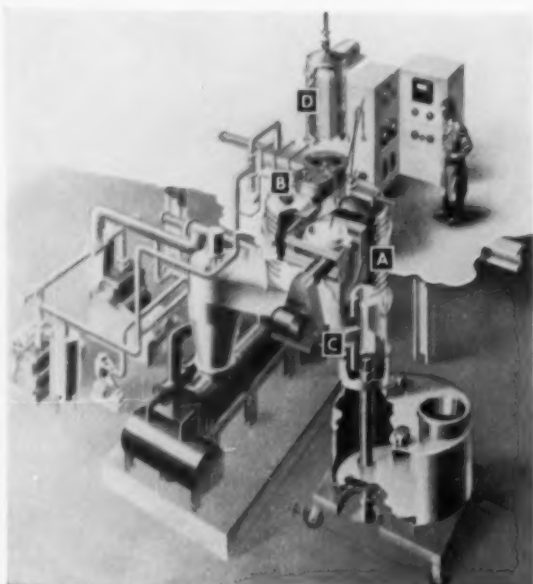
permit variation of casting techniques.

There are four basic designs for the furnace bottom: for casting single molds per vacuum cycle, for multiple molds, for centrifugal casting, and for semi-continuous operation. In addition to the flexibility of casting technique offered by interchangeable bottoms, they also facilitate cleaning of the chamber and simplify repairs in the event of spill-outs.

The buyer of one of these furnaces through a choice of different chamber bottoms can institute alternative casting methods as required.

Consolidated Vacuum Corporation, ROCHESTER 3, N. Y.

CVC sales now handled through Consolidated Engineering Corporation with offices located in: Albuquerque, Atlanta, Boston, Buffalo, Chicago, Dallas, Detroit, New York, Palo Alto, Pasadena, Philadelphia, Seattle, Washington, D. C.



This installation implements all the basic modules discussed in the text. It is used for true semi-continuous melting and casting.

A Center chamber section and vacuum pumping system.

B Cover with control and inspection devices.

C Chamber bottom with multiple mold and interlock. Ram, which emerges from the floor, is moving the mold up to pouring position.

D Charging interlock with pre-heating induction coil.

D Interlocks

easily convert batch operation to semi-continuous production.

Semi-continuous operation is provided by adding interlocks through which the crucible can be charged, the alloying elements altered or adjusted, and the ingots or castings removed. The operator can accomplish all of these without breaking vacuum in the furnace.

Since these interlocks are accessory items, they can be added to the top and bottom sections as desired by initially providing flanges to accommodate them.

Tremendous leeway in planning for future as well as present needs results from this "building block" or module concept of high-vacuum furnace design.

Another great advantage is that damaged or obsolete parts can be replaced with little down time, at small cost.

If you would like more detailed information about the module concept in vacuum furnace design or information about any phase of vacuum metallurgy, contact **Consolidated Vacuum Corporation, Rochester 3, N. Y.** (a subsidiary of Consolidated Engineering Corporation, Pasadena, California). Reprints of this and other information memos in this series are available on request.

The Iron Age Newsfront

Military Cuts Hinge On Realistic Reserve

Whether or not military cuts are carried through may depend on the fate of the reserve program. The 1955 "new look" assumes a realistic reserve program. If Congress does not act on the reserve program it might be necessary for the Administration to temporarily hold off on military cuts.

Ceramic Antifriction Bearings

Experiment work is being carried on to develop ceramic antifriction bearings for applications at temperatures above that at which steel bearings can perform. The Germans carried on extensive work with ceramic roller bearings for aircraft use during World War II.

Pressed Metal Rocker Arms Tried

Automakers who have tried pressed metal rocker arms on new engines have had varied results. One has had outstanding success, another reportedly had a few go through the valve covers. Major advantages of stampings are lower cost and reduced weight.

Consumers Plan Higher New Car Outlay

Confident consumers are willing to spend more this year for the new cars they want. Federal Reserve Board says the average planned outlay for a new model is \$2800. That's \$300 more than buyers expected to spend in 1954. At the same time, an unusually high percentage (7.2) want used cars.

Suggest Ceramics for Welding Jigs

Welding and brazing jigs offer a promising application for new ceramic materials. Low thermal expansion is an outstanding advantage of ceramics for such applications.

Coal Shows to Advantage

Greatly improved efficiency of coal burning equipment used in producing electric power has given this power source an improved competitive position in many areas. One aluminum producer, based on overall cost of producing and delivering aluminum to the consumer, is now actively interested in coal producing properties.

Tug-of-War Over Engineers' New Home

A tug-of-war is shaping up over location of a new home for the founder engineering societies. Strong forces are backing a proposed move to Pittsburgh. An equally strong group is willing to help the groups find a new home in New York.

Air Pollution Controls Succeed

Only one-half ton of particulate matter is emitted into the air daily in the big and busy Los Angeles County steel producing area, according to a recent report. The area includes 15 steel producers operating 41 furnaces. Total melt is better than 2000 tons daily.

Vacuum Melted Tool Steels for Bearings

Vacuum melted tool steel bearings are expected to find future applications where high efficiency at high operating temperatures is required. These cleaner steels could operate at up to 750°F if suitable lubrication methods were devised, it is claimed.

Gas Rationing Would Be Tighter

Despite wide use of low grade fuels for jet planes, war-time needs for gasoline would be greater than ever, government planners say. Rationing, in event of war, would be as tight or tighter than in World War II.

Plan Lake Barge Scrap Shipments

Scrap shipments via Lake barge from Milwaukee to points south will begin in the near future. Initial runs with other cargoes have already been made, but scrap was a strong factor in initial planning of the new barge service. Sample rate: \$4 per gross ton on a 1000 ton shipment from Milwaukee to Peoria; \$5.39 from Milwaukee to St. Louis.

Proposed Rate Change A Factor

The proposed rate change for barge shipment on 500 gross ton lots could be one factor affecting scrap movement in the Chicago area. Now \$7.83 plus 15 pct per ton, a \$5.89 plus 15 pct rate has been proposed for the Chicago-New Orleans run.

For **LARGE HOLES**
in **TOUGH METALS**
you need a . . .

BAUSH HEAVY DUTY DRILL

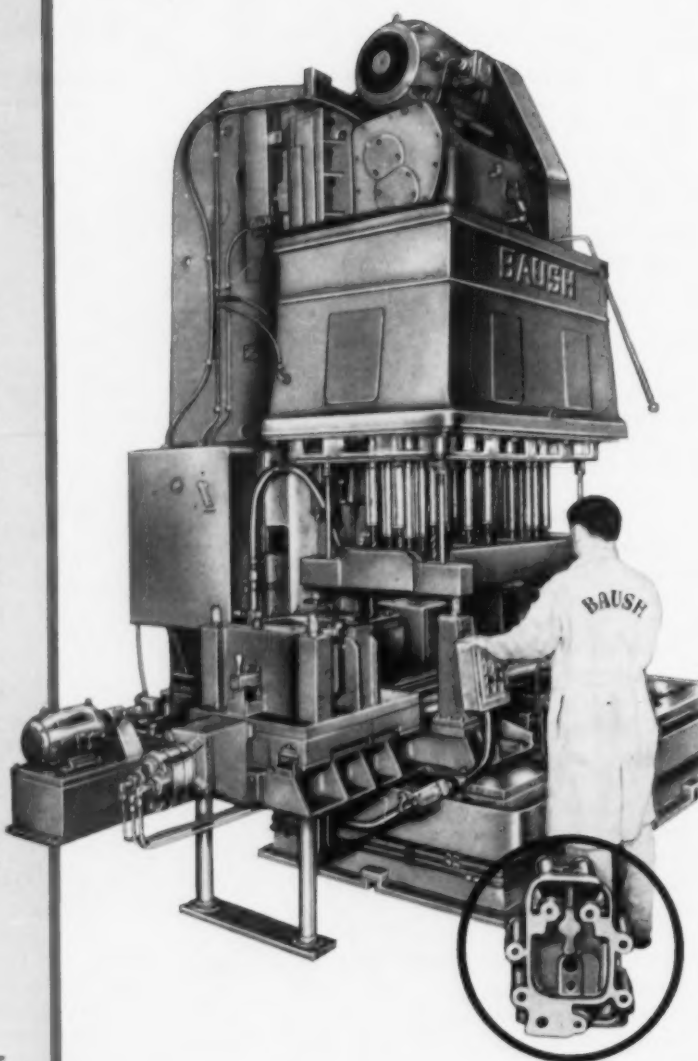
. . . just as one large engine maker has selected the Baush Vertical W8 Hydraulic Multi-Spindle Drill illustrated for drilling, core drilling and reaming heavy diesel motor cylinder heads.

The experience and know-how of Baush, gained through more than 60 years of building equipment with a reputation for sturdiness, long life and extremely low "down time," is exemplified in such a unit.

Designed to operate with a 4-position sliding fixture this machine drills 16 holes from 21/32" dia. to 1 1/2" dia., as well as core drilling 12 holes from 1-5/32" to 1 1/2" dia. and reaming 2 holes to .871; making a total of 30 slip-sleeve spindles with nose adjustment incorporated in a special head 28" x 54" of the adjustable joint driven type, with master bored cluster plate.

30 H.P. 1800 R.P.M. spindle motor arranged for Texrope drive furnishes drilling power and a 7 1/2" H.P. 1800 R.P.M. motor drives hydraulic pump.

B
BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS



Why not send us your heavy duty machine problems **TODAY** — our engineers will gladly work out your operations to give maximum production with lowest operating, as well as maintenance cost.

What's Behind The Aluminum Shortage?

Sharp consumer inventory cutback in '54 coupled with startling resurgence of economy has put pressure on aluminum . . . Foreign scrap demand has upset secondary market . . . Price hike coming—By E. C. Kellogg.

♦ **ALUMINUM USERS** might as well face it: There is an aluminum shortage.

The scarcity hasn't reached panic proportions and the odds are it won't. But there's no sign the scramble for aluminum will be over soon.

Many people in the industry still say there isn't a "real" shortage. This view has to be discounted as even the government has belatedly acknowledged that the market is more than just tight.

There's not much shortage talk coming out of Washington, partially because officials are afraid of creating a jack-rabbit market. But the government's recent action in diverting 75,000 tons of aluminum from the stockpile and placing a 9000-ton second-quarter ceiling on aluminum scrap exports is the tipoff.

Pressure on Scrap

What's happened to aluminum closely parallels the trend in steel. When the recession started, aluminum users began living off the inventory shelf. The inventory cutback went too far and when business began to pick up, they all came back into the market at the same time.

Many consumers upped their orders over what they actually needed in an attempt to rebuild their stocks. This hasn't worked too well because there just isn't enough aluminum around to permit much inventory building. Also aluminum users found demand for their own products was greater than they anticipated.

Aluminum market first showed signs of strengthening near the

end of the third quarter. The real squeeze became evident in January and it has been getting tighter ever since.

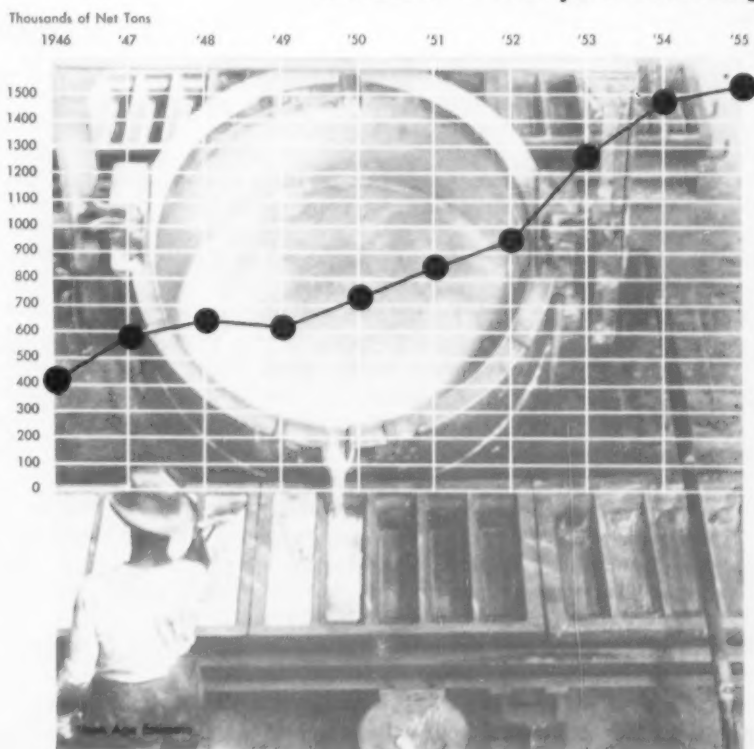
Adding to the pressure on aluminum supplies has been heavy European demand for scrap and the 15 pct drop in Canadian exports to the U. S. during '54. Dominion producers are still courting European markets because at the moment they're more profitable.

And as the U. S. aluminum market tightens new forces are entering which are intensifying the

shortage. With scrap prices rising and supply dwindling, smelters have been forced to go after primary aluminum which they don't normally touch. And independent users of primary aluminum, anxious over their supplies of raw materials, have in turn been buying scrap. Normally they are not in the scrap market. Result: the shortage is feeding itself.

It's not hard to find indicators of the aluminum scarcity. Since the first of the year, prices of some types of aluminum scrap

Aluminum Output Soaring



SPECIAL REPORT

have jumped more than 30 pct and are now near the price of primary pig (21.5¢ per lb).

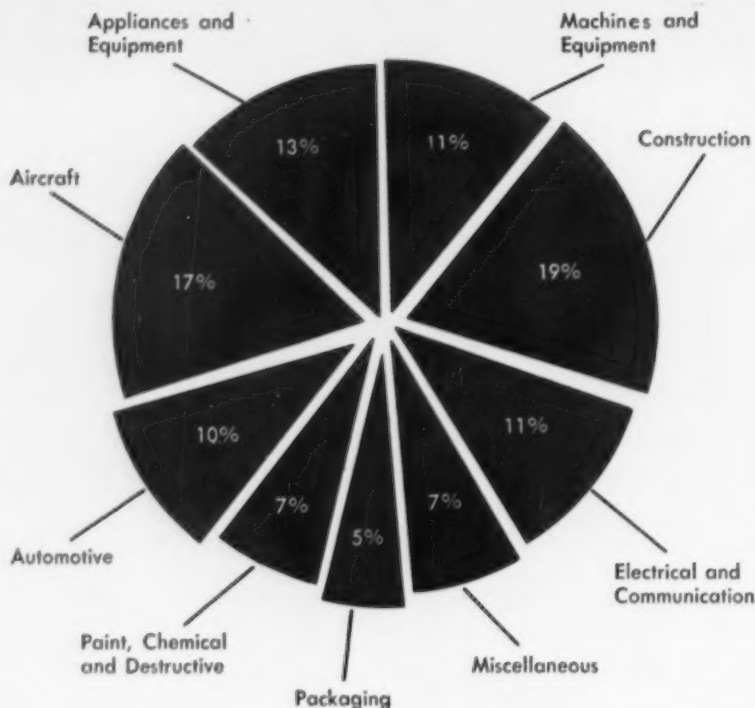
Price of secondary aluminum ingot, reflecting higher scrap prices and increased demand, has skyrocketed from less than 23¢ per lb in January to a current level of around 31¢.

On mill products, some producers of aluminum sheets are sold out into July. Buyers who aren't already listed on order books can't get sheets unless they call on a warehouse. Bars and wire aren't as tight, but are rapidly approaching the same condition.

Price Hike Coming

Outlook for the rest of the year is not encouraging so far as consumers are concerned. Aluminum's main users, construction, aircraft and automotive are all booming. And even if the terrific auto production rate stalls, the continuing growth of new uses for aluminum, particularly in the appliance field, will help make up part of this demand loss.

Aluminum consumers also face the prospect of another price increase. Pressure is mounting and a price jump could come soon, though it will most probably be delayed until after the next labor go-round at the end of July. Settlement will be along the pattern set in the steel industry with workers getting an increase of between 8¢ and 10¢ an hour. Price



Where the Aluminum Goes

jump for aluminum is likely to run a cent or more per lb on primary metal.

New Capacity Coming In

There are, however, a few encouraging signs for consumers: aluminum production this year will set another record, topping 1.5 million tons. If there's a severe drought this figure would of course be knocked flat since roughly 60 pct of aluminum industry's

capacity depends on water power.

Also total aluminum shipments this year should hit an all-time high of 1.7 million tons, compared with 1.5 million tons last year. All of this increase in tonnage is expected to go into civilian channels.

Another factor: after the middle of the year new capacity will be coming in. Anaconda's new facilities are rated at 60,000 tons per year and Alcoa's Texas expansion will add another 65,000 tons. However, not much production from these facilities can be expected this year.

The government will also probably continue trying to ease the shortage by diverting part of scheduled stockpile shipments to industry. Another government-industry study of aluminum supply is scheduled for May and rumor now is that the government may then decide to give industry another 50,000 tons of stockpile-earmarked aluminum.

There's also the possibility that more aluminum will be coming

Is Aluminum Shortage the Real McCoy?

■ Some industry people insist there is no "real" shortage of aluminum.

■ But there are plenty of arguments on the other side.

For instance:

■ The Government diverted 75,000 tons from the aluminum stockpile and imposed a 9000-ton second quarter ceiling on exports.

■ Consumers face the dual problem of obtaining current requirements and rebuilding depleted inventories.

■ Secondary aluminum price exceeds that of primary metal.

Aluminum scrap price approaches that of primary pig.

Sheet producers are sold out into July; consumers not yet on order books must rely on warehouses.

■ Aluminum is an expanding industry. Even a slowdown in major consuming industries would not relieve pressure on supply for long.

down from Canada later on this year.

Current aluminum shortage has again started people wondering whether present U. S. capacity is enough. There has even been some talk in Defense Dept. circles of a possible government-backed third round aluminum expansion but nothing is expected to come of this in '55.

There is no doubt that over the long run a capacity buildup for a growth industry like aluminum is a must. Part of the reason for Aluminum Ltd.'s planned doubling of capacity at its Kitimat, B. C., smelter is based on the assumption that U. S. aluminum demand will expand faster than domestic capacity.

Problem of how much to expand is a tough one for aluminum producers because of the government's stockpiling program. Situation right now is that there is probably more than enough capacity to take care of civilian and defense needs but when the stockpile demand is counted capacity is lacking. Producers are naturally worried about what would happen if stockpiling requirements were suddenly slashed so they are moving with caution when it comes to adding new capacity.

Porcelain:

Market looks solid as inventory control ends.

Porcelain enamel sales are on the upgrade after a slight drop in 1954.

Big factor in the moderate increase expected by the Porcelain Enamel Institute is the increase in appliance sales. This is attributed to that 1954 malady of inventory reduction, which plagued almost every major industry during the past year.

In 1954 porcelain enamel sales reached \$370 million. This total is broken down into the following distribution figures: Household appliances, \$173 million; building products, \$102 million; industrial equipment, \$31 million; cooking utensils and hospitalware, \$28 mil-

lion; signs, \$6 million; jobbing and miscellaneous, \$30 million.

A major problem facing porcelain enamel demand is the advance of other materials into the appliance field that it once monopolized. Aluminum, stainless steel and new paints are all becoming factors in the manufacture of stoves, heaters, washers and refrigerators.

The continuing construction boom that annually amazes the experts in number of home starts has contributed to the demand for porcelain enamel plumbing fixtures, hot water tanks and architectural products. With 1,250,000 home starts estimated in 1955 compared to 1,215,000 in 1954, demand for household fixtures will logically increase. Private non-residential building, also a big source of porcelain enamel products demand, will be an estimated \$6.4 billion in 1955 compared to \$6.6 billion in 1954.

Steel:

Light gage products take 66.4 pct of shipments.

Light gage steel product shipments made up 66.4 pct of finished steel shipments last year, highest annual percentage ever reached, according to American Iron and Steel Institute.

Automotive, container, household appliance and other consumer goods industries were prime takers.

Sheets and strip of all kinds accounted for 25 pct of finished steel shipments to construction and contractors' products classifications. In 1949, these categories took 22 pct of finished steel shipments.

The trendline for heavy products, shapes, plates, rails, billets, and skelp has been downward in recent years, compared with a more than 50 pct peak during World War II.

Steel: What Mills Shipped in February

As Reported to the American Iron and Steel Institute

STEEL PRODUCTS	FEBRUARY 1955					YEAR TO DATE				
	Carbon	Alloy	Stainless	Total	Pct of Total Shipments	Carbon	Alloy	Stainless	Total	Pct of Total Shipments
Ingot	17,185	14,571	1,547	33,303	0.5	31,763	28,320	3,496	63,579	0.5
Blooms, slabs, billets, tube rounds, sheet bars, etc.	182,443	38,086	1,207	221,736	3.8	316,478	78,587	2,329	397,394	3.3
Skelp	10,365			10,365	0.2	18,976			18,976	0.1
Wire rods	86,331	1,619	778	88,728	1.5	158,483	3,643	1,314	173,380	1.4
Structural shapes (heavy)	336,821	1,825	20	338,666	5.5	668,901	6,431	20	675,351	5.6
Steel piling	26,555			26,555	0.4	48,135			48,135	0.4
Pipes	436,938	18,585	1,466	456,989	7.5	851,994	38,945	2,735	893,674	7.4
Rails—standard (over 60 lbs.)	86,909			86,909	1.6	189,338			189,338	1.6
Rails—all other	6,130			6,130	0.1	10,809			10,809	0.1
Joint bars	2,912			2,912		6,195			6,195	
Tie plates	18,888			18,888	0.3	34,612			34,612	0.3
Track spikes	8,985			8,985	0.1	10,950			10,950	0.1
Wheels (rolled & forged)	21,480	120		21,600	0.4	43,121	284		43,405	0.4
Axles	8,233	14		8,247	0.1	15,589	16		15,605	0.1
Bars—hot rolled (incl. light shapes)	473,824	154,364	3,108	630,496	10.3	935,168	312,325	6,171	1,253,663	10.4
Bars—reinforcing	126,219			126,219	2.1	243,988			243,988	2.0
Bars—cold finished	106,469	21,806	3,880	134,146	2.2	218,490	43,806	7,453	269,751	2.2
Tool steel	1,130	6,782		7,912	0.1	2,171	13,553		15,724	0.1
Standard pipe	202,349	111		202,460	3.3	396,410	242		396,652	3.3
Oil country goods	157,418	28,425		185,843	3.1	306,339	58,421		364,761	3.0
Line pipe	135,409			135,409	2.2	254,786			254,786	2.1
Mechanical tubing	49,186	18,378	380	67,944	1.1	*87,151	*36,185	*577	*123,913	1.1
Pressure tubing	14,831	2,606	1,033	18,472	0.3	*30,440	*4,813	*1,971	*37,224	0.3
Wire—drawn	215,591	3,657	2,389	221,637	3.8	426,764	7,067	4,714	438,545	3.6
Wire—nails & staples	51,256			51,256	0.8	100,736			100,736	0.8
Wire—barbed & twisted	14,523			14,523	0.2	25,376			25,376	0.2
Wire—woven wire fence	36,833		1	36,834	0.6	65,724		1	65,726	0.6
Wire—bale ties	2,890			2,890	0.1	5,161			5,161	0.1
Black plate	56,580			56,580	0.9	118,953			118,953	1.0
Tin & terne plate—hot dipped	86,189			86,189	1.5	171,063			171,063	1.4
Tin plate—electrolytic	344,467			344,467	5.8	680,149			680,149	5.6
Sheets—hot rolled	792,597	28,099	3,154	733,850	12.0	1,402,860	58,475	5,405	1,467,740	12.1
Sheets—cold rolled	1,118,184	4,479	9,175	1,131,838	18.5	2,392,889	7,715	18,318	2,418,922	19.1
Sheets—galvanized	196,234	174		196,408	3.3	410,029	489		410,518	3.4
Sheets—all other coated	18,864			18,864	0.3	40,555			40,555	0.3
Sheets—enameling	22,310			22,310	0.4	42,376			42,376	0.3
Electrical sheets & strip	11,521	47,223		58,744	1.0	21,519	94,036		115,555	1.0
Strip—hot rolled	355,825	2,317	585	358,727	2.6	311,552	4,221	1,022	316,795	2.6
Strip—cold rolled	109,870	1,007	20,128	131,005	2.1	220,131	2,082	41,410	263,623	2.2
TOTAL SHIPMENTS (1955)	5,877,138	293,932	48,830	6,219,900	100.0	*11,235,769	*796,749	*95,945	*12,128,463	100.0
TOTAL—PRIOR YEAR (1954)	5,617,246	312,971	34,761	5,964,978		10,378,777	640,716	72,948	11,092,441	

* Revised.

STAINLESS: A Market in Milk Hauling

Bulk pickup of milk creates new stainless uses . . . Rattle of old milk can fades . . . Market lies in tank trucks, individual farm tanks and central holding tanks . . . Long hauls possible—By K. W. Bennett.

◆ **FINAL CURTAIN** is ringing down on two traditions of rural America—the milk can, and the early morning milk train that hauled it to the big city.

The business of replacing them is providing one of the most rapidly expanding markets in stainless steel. The 15,000-20,000 farms and 1000-1200 trucks currently in bulk milk pickup are regarded as a relatively light surface scratch in a stainless sheet market potential that is doubling annually.

Bulk pickup of milk began on the West Coast in 1939. The farmer places the result of his milking time chores in a stainless steel holding tank that is equipped to cool the milk to 40 deg., large enough to hold 1-3 days production. A tank truck, serving approximately 19 other similarly equipped farms, drives up, pumps the milk from the holding tank into its own 1500-1800 gal. tank, and hauls the full load to a central processing or collection point.

From a central collection point, the milk is pumped again into a 2500 to 4000 gal. transport truck and is then hauled as far as from Wisconsin to Texas; a 1400 mile haul that has been made regularly for at least two years.

Method Gaining

Producers of bulk pickup equipment indicate that the California beginning in 1939 was cut short by wartime demands on both transportation equipment and stainless steel, but by 1946 the bulk pickup movement began snowballing, hit the East Coast by 1950, and currently is estimated to be used on more than 15,000 farms.

In 1953, it was reported by Heil Company, a major producer of the truck tanks, that about 7000 farm

pickup tanks had been installed on farms in 38 states. Other industry sources conservatively estimate that at present there are 15,000 pickup tanks installed on farms. Each 20 farms are served by a special pickup truck carrying pumping equipment and a bulk tank consisting of an inner stainless steel shell and an outer shell of 18 ga. sheet, 20 ga. stainless, or recently, of tough plastic.

The Department of Agriculture has tallied 656,158 dairy farms having 10 or more cows, about the lower limit to the bulk milk pickup economics, though there's some evidence that even on an eight cow farm the farmer may add heft to his milk check with a pickup tank. Either way, the figures argue an impressive market potential, with a rapid pace. For instance, it's been estimated that by 1958, all of 2,200 milk producers in the Washington, D. C., area will be equipped with farm milk tanks.

10-Year Market

Producers of the equipment agree. One told *THE IRON AGE*, "Using 1951 as a base year, we estimate that the industry did in 1952 about 2.5 to 3 times the 1951 volume; in 1953 did about 7-8 times the 1951 volume, and in 1954 about 16-17 times the 1951 volume."

Said a matter-of-fact statistician for a major producer of bulk milk pickup equipment, "It's pretty safe to say this thing is good for another 10 years. For the first five we expect industry volume to double every year, and to continue upward at a substantial rate for another five years after that. From that point on, we will begin working on the replacement market."



STERILIZED hose and pumping equipment are used in transferring milk from holding tanks to tank truck.

Estimates of the total number of truck - and - stationary tank manufacturers range from 20 to 40. Names commonly mentioned include the Heil Company, Milwaukee; Cherry-Burrell Corp., Chicago; Wilson Refrigeration, Del.; McHale Manufacturing Co., Calif.; Creamery Package Manufacturing Co., Chicago; Mojonner Bros., Chicago; C. E. Howard Corp., Calif.; as well as other firms, most of which are long established in dairy equipment or specialty tank manufacture.

Producers Interested

While one equipment producer indicates that the total market might be 70 pct of the dairy farms in the U. S., other sources argue that even the smallest farms can be included in a bulk milk pickup system, again using stainless steel holding equipment for the fresh milk.

Two major steel producers have completed market studies.

INDUSTRY: Boosting Aid to Education

Industry grants running about \$70-75 million yearly . . . Stepped up corporate aid seen for future . . . Broader-scope giving programs still in embryo stage . . . Steel among leaders—By D. G. Picinich.

♦ **INDUSTRY** is insuring its future by expanding aid-to-education programs.

Two recent surveys by the Council for Financial Aid to Education, Inc., indicate the rising trend.

Grants by the nation's 672,000 corporations to all institutions of higher learning in 1953—last year of Excess Profits Tax—are estimated by the Council at between \$70 and \$75 million. This compares with an estimated \$53 million corporate allocation in 1950.

1954 contributions are expected to equal the 1953 estimates despite absence of EPT. And, for the years ahead, present indications point to gradually stepped-up financial aid programs.

Schools Hard Pressed

Survey results, based on answers from 753 schools, show: (1) 59 pct of non-denominational private colleges and 62 pct of private universities are operating in the red; (2) within the next 10 years, over half the schools report they'll need more than \$3 billion in added endowment plus another \$2½ billion for new buildings, equipment and maintenance.

Of 367 firms responding to the survey, 45 pct—all among the 1000 largest—reported contributions of varying amounts for the general maintenance of colleges. Of these, 73 pct are making unrestricted gifts.

Giving impetus to industry aid to education are: (1) increasing need for college-trained people, particularly engineers, and (2) growing awareness by management that support of higher education is good business.

Some 50 top businessmen met recently at Harriman, N. Y., to

consider problems of corporate support for education. General Electric Co. Pres. Philip D. Reed later reported a "surprising unanimity" among conferees that aid to education benefits industry.

New Programs Broadened

New Jersey courts last summer gave legal sanction to this view. The Court ruled that a corporation giving an unrestricted grant to a university was acting in its stockholders' interests and in fulfillment of legitimate corporate responsibilities.

In the past, a direct benefit was considered almost essential to justify a contribution. Recently, the trend has been toward a broadening of the areas of financial contributions.

U. S. Steel Foundation's aid to

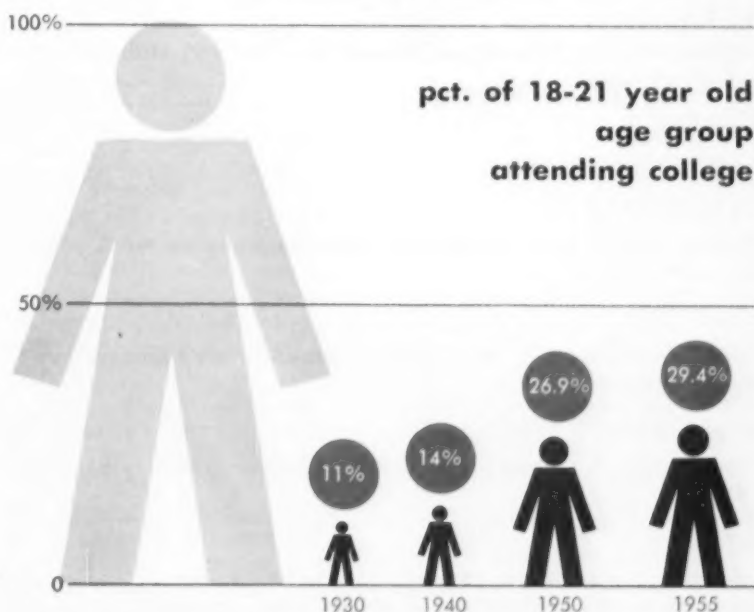
education program entered high gear last summer with \$700,000 allocated to liberal arts colleges.

Of this amount, about half has gone into college building and endowment campaigns. Contributions are unrestricted, but the Foundation reserves the right to select institutions included in the program.

Bethlehem Steel Co. reported payments totaling \$321,000 to 30 colleges and universities under its program of financial assistance to colleges and universities. Launched two years ago, the program is non-restrictive and grants can be applied to scholarships, facilities or for other purposes.

General Motors Corp. this year announced a new \$2 million annual fund program which ups its total annual grant to over \$4 million.

Why Colleges Need More Aid



STEEL: Its Momentum Still Grows

Late buyers may find slim pickings . . . Summer slump is not in sight as backlogs and delivery delays mount . . . Automotive labor hurdle should be cleared . . . All products pickup—By J. B. Delaney.

♦ **STEEL BUYERS** who take too seriously talk of a third quarter letdown in demand may wake up with too little—too late.

Everything points the other way.

Reports from THE IRON AGE district editors confirm the growing belief that there will be no easing in the steel market of any consequence for balance of the year.

There's bound to be a little. The mills are operating at break-neck pace. April will establish an all-time production record. Steel producers are turning out finished steel in tonnages that are taxing truck and rail shipping facilities.

But even so, the traditional summer slump will be little more than a shallow dimple because:

Automotive—There will be no strike. The Guaranteed Annual Wage is the sort of animal that can be compromised. Both union and management are searching for stability in production and employment. The final program for attaining it need not necessarily be what the union is asking. It probably won't be. But a step in the right direction, regardless of the label, can be achieved without a strike. Meanwhile, sales of 1955 models are so good that at least

one major producer has postponed for one month plans for his 1956 model changeover.

Appliances—Recent cutbacks by some producers on steel requirements were not significant. Proof: (1) A major manufacturer was forced into conversion for a small tonnage due to a temporary mixup growing out of a shift in production units from one city to another, and (2) the same producer is talking about stepping up second half requirements based on anticipated demand for automatic washers, dishwashers, and other appliances.

Construction—Spending for public and private construction this year is expected to reach \$39.5 billion, compared with \$37.2 billion in 1954—itself a good year. Orders and backlogs of steel fabricators are moving up. Over 40 pct of business booked through February is scheduled for production in third and fourth quarters. Producers of structurals are booking orders for July-August delivery; some consumers are angling for position in September.

Pipelines—Projects already approved and underway are behind strong demand for electricweld and seamless line pipe. Delay of the Trans-Canada gas line has had an easing effect on electricweld, but other projects have taken up some of this slack. Nevertheless, electricweld looks good through first half and tentative business probably will carry through third quarter. Seamless already is booked through third quarter. Electricweld demand is a strong factor in booming plate market. Oil field mill stocks are low.

Steel Products Outlook

SHEETS . . .

Hot rolled, cold rolled, galvanized, enameling, and stainless good for balance of year. Tin plate may ease seasonally in fourth quarter.

BARS . . .

Carbon and alloy look strong through third quarter. Stainless bars gaining strength.

PLATES . . .

Strong through third quarter.

STRUCTURALS . . .

Already booked into July-August. Consumers angling for September position.

LINEPIPE . . .

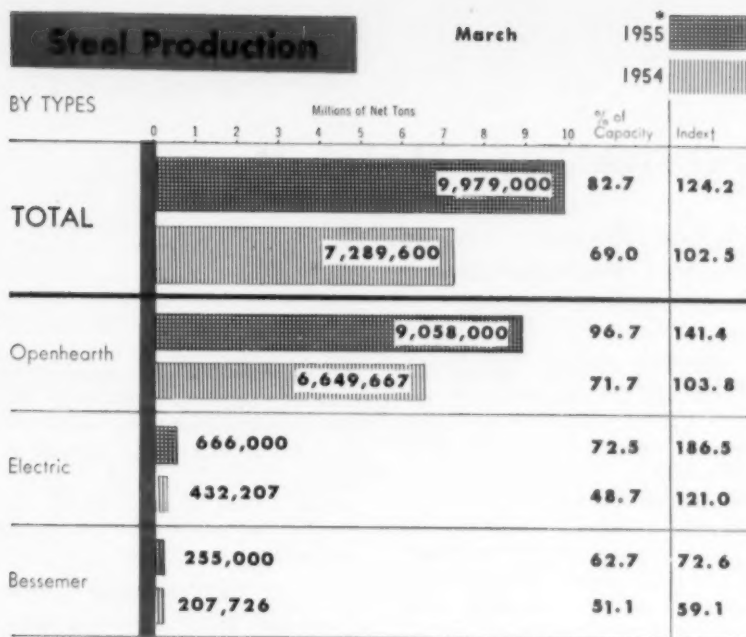
Electricweld good into third quarter. Seamless third quarter business already solid.

OIL COUNTRY GOODS . . .

Good through third quarter, at least. Consumer inventory-building a factor.

WIRE . . .

Automotive, appliances, general manufacturing, the farmer, and construction will hold market at strong level.



Source: AISI *Preliminary Figures

†Index of production based on average production of the three years 1947-1948-1949.

Oil Well Drilling—Wells drilled this year will equal or exceed record-breaking 53,930 of 1954. A 1955 total of 54,440 is predicted. More steel will be used in each well—average depth increased from 3538 ft in 1949 to 4061 ft in 1954 and is running higher this year. Producers of oil country goods are counting on good business through third quarter, at least. Casing and tubing orders already are booked 90-120 days ahead and moving out. Consumer inventories were low at beginning of the year and efforts to rebuild them are another factor in assessing outlook for balance of 1955.

Farm Market—The farmer is buying more this year. Although overall income is off, per capita farm income is up. This has stimulated farm equipment sales. It also has contributed to the growing demand for wire products in competition with construction, automotive, and other industries. The farmer is making up for his cautious attitude last year.

Railroads—Carloadings are expected to increase by nearly one million during first half of this year over 1954. In first 13 weeks

of this year loadings were up 418,000 over the same period last year. The railroads are making money. They will spend about \$800 million in 1955 for new plant and equipment. They also are stepping up their spending for repairs. For instance: Baltimore & Ohio since Jan. 1 has recalled 21.5 car repair units totaling 1075 men. Others report comparable activity. Order backlog for new freight cars is increasing.

Machinery—This will be a good year for builders of machinery and equipment. Steel companies will contribute to this through outlays for rolling mills and other facilities. Machine tool builders look for new business of between \$600 and \$700 million compared with \$560.5 in 1954. Electrical equipment manufacturers expect a 15-20 pct improvement this year over last.

Containers—Reports to Commerce Dept. from producers of steel shipping containers (barrels, drums, packages, kegs, and pails) indicate business will be better this year than last. Domestic and export demand for tin plate is strong.

Shipbuilding—This market is coming to life. Washington sources say the Federal Maritime Administration soon will start spending some of the several hundred million dollars available to it for matching payments on various types of ships. Navy also is stepping up spending for shipbuilding. This will affect plates, other steel products.

Other Industries—Warehouses, which supply a variety of industries, large and small, report a steady increase in business. In some areas, incoming business is better than at any time since 1953.

Inventories—Don't overlook the importance of inventory-building by all consuming industries. Due to pressure of their own consumption and competition from other users for available steel, most companies have been unable to do much, if any, building of stocks. This will have a stabilizing effect on the steel market this summer since any freed mill space will be taken up by inventory-conscious consumers. Estimated inventories at beginning of 1955 were 12 million tons. At best, consumers will be able to add 2 million tons before the year is out. This would be only 3 million tons above the post-1952 strike low of 11 million tons.

Make More Containers

Nearly all branches of the container industry foresee a larger business volume this year than last, and some segments are predicting record operation, the U. S. Commerce Dept. reveals.

Manufacturers of steel drums and pails believe their output in the current half-year will be at or above that in the comparable period of 1954. Metal can producers also find business prospects this year very favorable.

Reviewing container operations for the fourth quarter 1954, Commerce Dept. notes appreciable improvement over the level for fourth quarter 1953 in shipments of metal and plastic caps, home canning closures, and metal cans. The increase for caps was 5.8 pct; for closures 14.6 pct.

MICROFILM: Mountains Turn Molehill

Film uses range from police line-ups to drafting rooms . . . Handling ease rivals space saving as big advantage . . . Film maker places business savings at more than \$150 million annually—By G. J. McManus.

♦ CRIMINALS ARE finding St. Louis a tough town to do business in today for the same reason many engineering departments are functioning more efficiently. The answer: Microfilm.

St. Louis police use the small film plus modern filing techniques to keep the faces of known criminals on fingertip call. If a witness says he was slashed by a man with a bent nose, police pull all bent-nosed slashers from the file and flash their twisted features on a screen.

Same principle is applicable to production documents. Bulky drawings are reduced to filing

card size and all the amazing card extraction systems can be employed to get at particular prints.

Handling ease is a microfilm advantage just now being fully exploited and it is only one of many benefits cited for the process.

"Use of microfilming in American business saves over \$150 million annually by eliminating needless accounting routines, storage space, and filing equipment," says John K. Boeing, president of Recordak Corp.

Microfilming first came into wide use as a means of protecting records. Vital company documents are duplicated on compact film

rolls and stored in caves or other disaster-proof shelters. Ford Motor Co. today stores over 18 million film copies in an area 20 x 30 ft. Space saving is placed at 99 pct original bulk. Stock ledgers, contracts, and engineering drawings are safely tucked away.

For Production Records

Another major microfilm application is for the storage of limited reference drawings and records. Fruehauf Trailer Co. began microfilming its older engineering drawings in 1946. Only drawings for the last 7 model years are kept in original form. The rest, dating back to 1919, have been put on microfilm and are stored in a small filing cabinet. The company has had no filing cabinet or room expansion expenses since the program started and estimates savings at \$55,000.

More use is being made today of microfilm for active production records. When the Otis Elevator Co. ran out of office space in New York, 140,000 tracings were transferred to Yonkers, N. Y. This left New York engineers 15 miles from drawings they needed daily.

To get around the difficulty, the tracings were microfilmed and the pictures were mounted on individual cards. Cards covering the 140,000 tracings went into 3 file cabinets in the New York office. When information is needed, the film is projected on a screen or an enlarged print is made.

Major Clerical Tool

At one time microfilming was limited to commercial operations for the most part and its most extensive use is still in this field. The accuracy and speed of the process in duplicating papers, as well as its space saving features,



MICROFILM pictures return to life size or bigger as viewing screen of Recordak Corp., New York, magnifies up to 40 times.

have made microfilming a major clerical tool for banks, transportation lines and retailers.

Bank checks are photographed automatically on both sides. The Navy uses microfilming for ships' inventory. Railroads film shipping documents at consolidating points. Insurance companies use the process for legal documentation of premium notices. Bills, legal papers, receipts, personnel records are among the many papers that go onto microfilm.

Takes Little Skill

Microfilming can be handled in a number of ways. Photographic equipment can be bought or rented. Or the job can be done on a contract basis.

The photographing process is largely automatic; requires no great skill or special lighting. Film is generally developed by the manufacturer.

There are two general classes of equipment. Commercial models using 16 mm film sell for \$450 to about \$3000; rent for \$17.50 to \$76.50. The 35 mm units sell for \$1700 to \$4500.

Study Tax Incentive

Office of Defense Mobilization is going to study the need for expansion of a few steel forms and shapes, after turning down a proposal that fast tax amortization be offered for expanded facilities to produce electrolytic tinplate, galvanized sheet, and additional continuous strip mills.

Under consideration at ODM is a proposal to offer fast tax write-off privileges for increased capacity to produce shell quality steel and some heavy castings because demands would overreach supplies in an emergency.

Reportedly, ODM turned down a proposal that the government encourage construction of additional facilities for tinplate, galvanized sheet and extra continuous strip mills because it is felt that present capacity and planned expansions could take care of the military needs, even though some civilian needs would be cut.

INTERNATIONAL

BRITAIN: Denationalize Steel

Nearly 60 pct of the once-nationalized industry is back in private hands . . . Trend will continue as output hits a new peak . . . Home demand exceeds production.

◆ **NEARLY 60 PCT** of the capacity of Britain's once-nationalized steel industry has been re-sold to private enterprise.

The Iron & Steel Holding & Realization Agency which began operations in July, 1953, reports that a total of 22 companies with 163 subsidiaries have reverted to private control.

In all, 71 companies with 231 subsidiaries came under the earlier Labor Government's nationalization program.

In its first report, the agency showed that from July 1953 to September 1954, it sold control of 13 companies with 126 subsidiaries. Since then, control of another 9 companies has been sold.

Book value of securities transferred to the agency, together with further agency investments up to September 30, totalled more than \$734 million. This compares with a book value of more than \$442 million for the 22 companies whose control has been returned to private enterprise.

Only the equity capital of several of these firms has been sold. The agency still holds a substantial amount of prior charge capital for future disposal.

Companies Listed

For the 14-month period covered by its report, the agency is unable to give any overall figure of profit on sales over the book value of the securities sold. It still holds for future disposal an adjusted book value of more than \$94 million of earlier charges in 6 of the 13 companies sold during the period. Nominal value of these earlier charges is more than \$131 million.

During the 14-month period, all the capital was sold of Arthur Lee & Sons; District Iron & Steel Co.; Hallamshire Steel & File Co.; Lan-

cashire Steel Corp.; Round Oak Steel Works; Sheffield Forge & Rolling Mills Co., and Templeborough Rolling Mills.

Only the equity capital was sold of Darlington & Simpson Rolling Mills; English Steel Corp.; Guest Keen & Nettlefolds (South Wales); Guest Keen Iron & Steel Co.; Stewarts & Lloyds, and United Steel Co's.

Since the end of the period, the equities of John Summers & Sons; Dorman Long & Co., and Colvilles & Whitehead Iron & Steel Co. have been sold.

Private sales have also been agreed on for the entire issued share capital of Birchley Rolling Mills; Wolverhampton Steel & Iron Co.; Goldendale Iron Co.; Lilleshall Iron & Steel Co., and John Bagnall & Sons.

Tinplate Imports

British steel ingot and castings production hit a new high in February.

The annual rate has climbed to 22,960,000 tons with home demand still outpacing furnace output. Order backlogs are mounting, especially for flat-rolled products.

Incoming shipments of U. S. tinplate since the beginning of the year have helped relieve the pressure on available domestic supplies. Demand, however, still outdistances availability and food canners in particular are pressing for additional imports. So far, the British Government has limited tinplate imports to 56,000 tons.

Clouding the picture is growing British concern over the nationalized coal industry's failure to supply enough fuel for the nation's needs. Distributed coal stocks are at their lowest level for this time of year since 1951.



ALL-ALUMINUM deck-edge elevator for carrier *Shangri-La* is claimed to be world's largest of its type.

Welding:

Navy welds aluminum to build big ship elevator.

Recent completion of a Navy carrier elevator demonstrates the strides that have been taken in welded aluminum construction. Built in Puget Sound Naval Shipyard for the carrier *Shangri-La*, the 87,000 lb elevator is said to be the largest all-aluminum, all-welded structure in America.

High tensile aluminum tube, supplied by Reynolds Metals Co., Louisville, Ky., was joined by the inert-gas, metal-arc welding process. Subassemblies were kept as large as possible. Welding sequence for best heat control was determined by tests.

Joint Design Helps

Elevator is essentially a cantilever structure. A series of transverse and longitudinal trusses are covered with longitudinal I-beams and a thin skin of aluminum. Two sets of rollers run in vertical tracks to provide vertical travel.

Structure joints have as many as nine pieces of tubing welded together at one point. Splice plates reinforce clusters and distribute loads among tubes. This

design is said to give greatly increased loading factors.

Weight saving achieved by aluminum construction is placed at 17 tons. Twelve or more such elevators are planned for other carriers.

Secrets:

Defense Dept. tightens rules on military releases.

The Defense Dept., acting on personal orders from President Eisenhower, has adopted a tough new policy on the releasing of military information. From now on, the Army, Navy, and Air Force are under strict orders to withhold from the press and from the public any information—especially technical data—that could be classed as “useful to an enemy of the United States.”

Defense Sec. Charles Wilson, in issuing a new Defense Dept. directive governing the release of information, made it clear that the armed forces must not curb “the proper flow of information to the public.” But, he said, the time has come to stop releasing information that’s detrimental to the national security.

The nation’s defense boss says flatly and firmly: “We must stop giving our potential enemies so much information about the performance and capabilities of our new weapons.”

Spies:

Hoover sees grave threat in vast Red underground.

Menace of subversive plotting is much greater in the present cold war than it was in World War II when Nazi and Fascist agents operated in this country, J. Edgar Hoover, FBI director, told Congress.

Reds Go Underground

The tremendous expansion of the Communist underground apparatus is one of the reasons, Mr. Hoover said. The Communists, he adds, have gone deeper underground because of legal reverses suffered during the last few years at the hands of Congress and the states.

Mr. Hoover told a House Appropriations subcommittee, the Reds have expanded their underground and have been conducting an intensive program over the years of placing members in key positions in our vital industries. “Sleepers” are dug in, ready to strike. One of the main targets has been a highly industrialized area in the East.

Expose Red Plans

The extent to which hard-core Reds infiltrate into steel and heavy industries is pinpointed in this recent testimony given the Senate by Ralph K. Heltzinger, an admitted former Communist from West Reading, Pa.

Richard Arens, counsel for the Senate Judiciary Committee: To what extent does the Communist Party concentrate on heavy industry in the area with which you are conversant, the Reading, Pa., area?

Mr. Heltzinger: They try to move into industries near steel. They usually pick steel because they feel that when steel is down the rest of the industries are down.

Defense Tags:

BDSA issues new defense order identification symbols.

Program identification symbols used by contractors and subcontractors on defense purchase orders are newly listed by the Business & Defense Services Administration.

This revised list includes only those symbols related to defense programs currently in effect under the Defense Materials System (DMS). BDSA notes that a few symbols have been dropped since the last time the list was published, almost 2 years ago.

All defense orders placed with suppliers of components, subassemblies, and controlled materials must, by DMS regulation, bear one of the symbols. Purchase orders so identified take priority over unrated orders.

Contractors may under certain conditions be authorized to use the prefix DX on rated orders. When this prefix is used with the proper identification symbol, such orders are given extra priority.

These are the program identification symbols currently in effect under the Defense Materials System.

Program Identification	Major Program Involved	Agency
A-1 Aircraft	Dept. of Defense	
A-2 Guided missiles systems		"
A-3 Ships		"
A-4 Tank-automotive		"
A-5 Weapons		"
A-6 Ammunition		"
A-7 Electronic and communications equipment		"
B-1 Military buildings supplies		"
B-5 Products for customers engaged in through E programs (self-assigned by producer)		"
B-8 Production equipment (for private contractors)		"
B-9 Production equipment (government owned)		"
C-2 Dept. of Defense construction		"
C-3 Dept. of Defense maintenance, repairs and operating supplies (MRO)		"
C-4 Certain munitions items being purchased by foreign governments through domestic commercial channels		"
C-5 Canadian military program		"
C-6 Certain direct defense needs of Foreign governments other than Canada		"
C-8 Controlled materials for naval stock account		"
C-9 Miscellaneous, including controlled materials allotments and ratings for programs formerly identified as follows: A-8 (fuel and lubricants), B-2 (subsistence), B-3 (transportation equipment)		"
D-3 Further converters (steel)	BDSA	
D-4 Domestic production only		"
D-5 Domestic construction only		"
D-6 Canadian programs		"
D-7 All foreign programs (except Canada)		"
D-8 Distributors, warehouses and miscellaneous		"
D-9 Maintenance, repairs and operating supplies (MRO)		"

E-1 Construction	Atomic Energy Commission
E-2 Operations (including MRO)	"
E-3 Privately-owned facilities	"
E-4 Canadian Atomic Energy Program	"
E-5 Electric utilities supporting AEC programs	"
AM Aluminum controlled material producers to obtain aluminum production materials	BDSA
AM-9000 Aluminum distributors	"
AF Aluminum foil fabricators	"
AP Aluminum powder fabricators	"

producers of engines, airframes, and other components for experimental fabrication of test equipment.

4. Direct government orders with titanium producers for titanium mill products to be furnished at moderate cost to qualified organizations for experimental fabrication into military components.

5. Use of titanium in selected military applications, other than aircraft, where the use would be economically feasible at the price level the metal is expected to reach in the future.

6. Expanded use of titanium in aircraft.

Titanium:

Government advances new program of expansion.

Defense Dept. officials and the titanium industry are now agreed on a six-point program of government aid in developing and expanding use of the metal.

The expansion program, in answer to criticism that defense contractors were reducing orders and use of the tough, light metal, calls for:

1. An expanded research and development program.
2. Government assistance to the titanium industry in developing improved melting and fabricating methods and equipment.
3. Government contracts with

Spokesmen OK Program

Spokesmen for titanium producers and fabricators endorsed the Defense Dept. program before the Commerce Dept., which has also unofficially put its weight behind the objectives. Companies represented at the meeting included Allegheny Ludlum Steel Corp.; Cramet, Inc.; Dow Chemical Co.; E. I. du Pont de Nemours & Co.; Mallory-Sharon Titanium Corp.; Rem-Cru Titanium, Inc.; Republic Steel Corp.; Titanium Metals Corp. of America, and also the Union Carbide and Carbon Corp.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Tube, electron, 138691 ea, \$281,542, Sylvania Electric Products, Inc., New York.
 Tube, electron, 60000 ea, \$270,960, General Electric Co., Owensboro, Ky.
 Tube, electron, 3000 ea, \$278,300, Tung Sol Electric, Inc., Newark 4, N. J.
 Pin assembly, for bomb, 2500, \$475,000, Hussakov Can Co., Chicago, Ill.
 Line maintenance tools, Var., \$595,579, The Sperry Corp., Sperry Gyroscope Div., Great Neck, N. Y., *George A. Dennis*.
 Automotive spare parts, 680000, \$456,082, General Motors Corp., GMC Truck and Coach Div., East Pontiac 11, Mich., *J. P. McManus*.
 Shell, H. E., 176000 ea, \$1,161,436, Basco Mfg. Co., Indianapolis, Ind.
 Bombs, miniature, 525000, \$262,500, Agricola Furnace Co., Inc., Gadsden, Ala.
 Mine case Mk 6 Mod 6, 7722, \$304,751, Lofstrand Co., Rockville, Md.
 Modulator, rectifier assy., 867 ea, \$3,251,095, Westinghouse Electric Corp., Baltimore, Md., *L. W. Wiley*.
 Electrical headset, 14666 ea, \$433,636, Roswell Corp., Brooklyn.
 Hoist-haul unit, 4231 ea, \$1,860,491, Dempster Bros., Inc., Knoxville, Tenn.
 Spare parts ORD-8, Var., \$10,000,000, (to be sub-contracted), The Firestone Tire & Rubber Co., Los Angeles 54, Calif. (60% to be sub-contracted), *H. E. Ludwick*.



"Okay, okay. What's yours in . . . the Wall Street Journal?"

EXPANSION IN INDUSTRY

Add to Plant Facility

Republic Steel Corp. plans an increased development program at the Gadsden, Ala., plant.

New facilities will include a continuous 54-in. hot strip mill, a continuous 54-in. 3-stand tandem cold mill, a 54-in. temper mill, a continuous pickle line, annealing furnaces, finishing, shearing and shipping equipment and also a 48-in. continuous galvanizing line.

The project marks the second major post-World War II facility development at Gadsden. The company completed a 30-in. gas transmission line pipe mill in 1948.

Other plant products include bars and wire items. The company's Gadsden operations include two blast furnaces and eight open hearth furnaces with an annual ingot capacity totaling about 789,000 tons.

Develops Coast Site

Norton Co., Worcester, Mass., will open a new grinding wheel manufacturing plant at Santa Clara, Cal., Jan. 1, 1956. Present renovation of the existing one-story, 50,000 sq ft facility is estimated at \$1 million.

Built in 1947, the structure was formerly used for glass fiber operations by Vibraclamp Corp. The Coast installation will be the 19th in the company's world-wide manufacturing operations.

The firm manufactures precision grinding and lapping machinery, high temperature refractory products, pulpstones for grinding pulpwood and flooring material.

Reach Output Milestone

Inland Steel Co.'s Indiana Harbor, Ind., plant recently passed a 90 millionth ingot ton milestone. Production is currently estimated at 5 million tons annually.

Since World War II, plant capacity has risen more than 40 pct.

\$40 million is being spent this year by the company for additional facility development including capital investments in new ore properties and other company-wide improvements.

Total capital expenditures since the war will amount to over a quarter billion dollars by the end of 1955.

Develops Facilities

Vitro Rare Metals Co., Canonsburg, Pa., has completed plans for a plant facility development program which will exceed \$200,000.

Construction has begun on a new boiler house and structural improvements in the plant.

The company refines and recovers rare metals for industrial and military use and processes uranium-bearing residue for AEC.

Reactor:

**GE's largest shipped to Ill.
power supply station.**

General Electric Co., Schenectady, completed tests and shipped to Joppa, Ill., Steam Electric Station the largest current-limiting reactor ever built by the company.

The 270,000 lb, 56,000 kva unit will be used as a tie between two 161-kv buses at the midwest facility supplying power to an atomic energy plant at Paducah, Ky.

Its function is to reduce current flow from one part of a system to another during a short circuit.

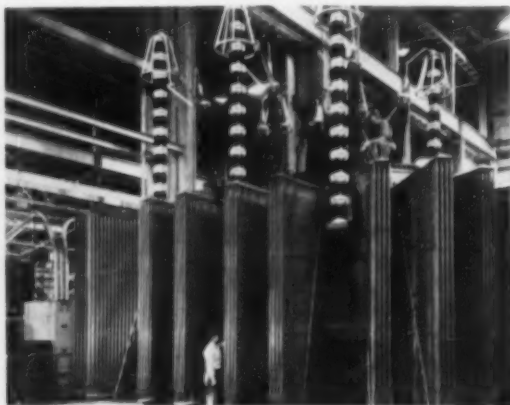
It is designed to withstand a short circuit current of about

7200 amp for 5 sec. Under normal conditions, its load is 56,000 kva at 1200 amp.

Overall unit height is 25 ft covering a floor space of 20 ft, 3-in. by 32 ft, 5-in. It has an oil capacity of 18,100 gal and weighs 135,000 lbs.

An aluminum shield encircles the reactor's three windings forming a tank within a tank. This helps prevent overheating during a short circuit.

Prior to construction, an electromagnetic model was built and tested to determine design for the completed unit. Shield configuration and its distance from the windings, critical factors in reducing heating losses, were among data obtained from model tests.



GE's largest current-limiting reactor will serve Midwest atomic energy power supply station.

7 benefits received by switch to STANOSTAMP Compound C

Jagemann Stamping Company, Manitowoc, Wisconsin, benefited seven ways by switching to STANOSTAMP Compound C. Finished ferrules drawn from 19 gauge cold roll steel were being badly scored. At the same time dies were being scratched and excessive heat experienced in the press. Standard Oil lubrication specialist R. E. O'Brien suggested STANOSTAMP. The result:

1. Production increased 20%
2. Die maintenance reduced 30%
3. Spoilage reduced
4. Finish improved
5. Galling minimized
6. Cooler machine operation
7. Washability improved

The results add up to this: There is a combination in the field of industrial lubrication that is hard to beat. It is (1) Standard Oil lubrication specialists capable of giving technical help and (2) Top quality products *that deliver results.*

STANOSTAMP Compound C is a water emulsifiable paste for heavy drawing operations. It contains an inert, non-abrasive mineral filler for protection of dies and work, is readily cleaned from work in conventional washing equipment. In the Midwest, your nearby Standard Oil lubrication specialist will be glad to tell you more about STANOSTAMP. Call him. Or contact: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Father and son inspect ferrules. William P. Jagemann (left), President, and son William T. Jagemann note improved finish on work produced using STANOSTAMP.



Air hose ferrules. One at right produced before switch to STANOSTAMP, one at left produced after conversion to this forming compound. Scoring of dies as well as work occurred before switch.

STANDARD OIL COMPANY
(Indiana)



CECO-DROP
does
more forging
per blow...
makes more
forgings
per hour



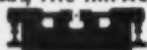
The piston-lift gravity drop hammer with short stroke control

CHAMBERSBURG

THE HAMMER BUILDERS

CHAMBERSBURG ENGINEERING CO.

Builders of **THE IMPACTER**



"FORGING IN MID-AIR"

CHAMBERSBURG, PENNSYLVANIA



Unsurpassed-anywhere!

IT ALL COMES DOWN to one fact...that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



ROEBLING 

A subsidiary of The Colorado Fuel and Iron Corporation



California giant Sequoias—
largest of all trees.

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A HALF CENTURY OF SERVICE

to the Iron and Steel Industry

Our half century of service to the metals industry has not been simply a matter of expanding productive capacity, nor producing more of the same.

To a large extent, it has been a matter of developing new uses for materials. It has been a problem of finding better products at lower cost . . . of looking continually for ways and means to help the steel and ironmaker meet the demands of his customers for better metals.

Consider our Research Center, for example. It's the most recent addition in our expansion program designed to broaden our service to the metals industry. This service provides our customers with valuable research information for solving alloy problems posed by today's complex and highly specialized needs.

Because a substantial increase in the use

of ferro alloys is essential to meet these growing demands, we have expanded our alloy production facilities. We have modernized and stepped up our mining and milling operations. Existing plants have been modernized. New plants have been built. Today—after a half century of steady growth—we are one of the nation's largest producers of ferro alloys.

Through our product diversification . . . our fully integrated mining, milling and smelting operations . . . our research facilities, we have been able to meet and often anticipate the needs of the iron and steel industry.

We take pride therefore in this half century of service. And we are pointing our resources and the energies of our people to another half century of service.

VANADIUM CORPORATION OF AMERICA

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Producers of alloys, metals and chemicals

Report To Management

Don't Buck the Upward Trend

It may be costly to go against the economic currents. This isn't the time to cut expenditures for new equipment, research, new product development and market expansion. Failure to go ahead for fear of an economic waterfall can be expensive.

Costs will go up, not down, for most of the expenses of doing business. These include labor, raw materials, fabricated parts, expansion and shipping.

Many business experts continue to worry about the outlook for summer and fall. But there is every indication that worries are unfounded. The Federal Reserve Board Index will continue to climb and may reach the 137 record figure before September.

Some of the question marks are erased each week. The decline in business outlay for capital goods is past and an upturn in expenditures is on the way. Purchases of new plants and equipment are expected to reach \$27.1 billion for the year.

Auto demand won't fall off to any serious extent. Automakers are convinced of this and are revising their model changes accordingly. It isn't generally realized that model changes are based on economic conditions. Automakers won't change while a market for the current model is assured. That's why delays in bringing out '56 models are important and encouraging.

Heavy construction fared better than most expected. Dodge Reports show March building and engineering contracts the highest in history for that period. The total will be exceeded by only one month in history. This was May of 1951, when huge atomic energy plant contracts created an abnormal total. This rate will continue through the summer and into the fall.

Weekly paychecks are fat

but there are some high unemployment levels in a few areas. Why employment didn't gain with production can be easily misunderstood. First, the workweek had to climb from cutbacks to less than 40 hours before additional workers were hired. Then, overtime seemed to be the answer to special problems. Overtime, as an indication of a labor demand, is not reflected in national figures while local surpluses are underlined.

Employment started to climb as these local shortages and surpluses tended to level off. And workers are taking home more money for each week of work. Personal income for February was up a full \$1 billion from January and \$7.4 billion higher than a year ago.

Each employee works longer than he did a year ago and at a rate averaging at least 5¢ an hour higher. This is translated into immediate consumer purchasing power for more appliances, autos and all consumer goods. The upshot is what might be called cumulative prosperity.

Congress and the roadbuilding program

They aren't getting along too well. Methods of financing are the big block in pushing through anything like the 10-year, \$101 billion program Ike wants.

But this won't hurt the economy.

In fact, much of the resistance hidden behind political double-talk is a hangover from depression days when highway programs were public works programs. Although no one argues that the roads aren't needed, the public urgency just isn't strong enough to break through the many small sectional and political obstacles that continue to arise.

Look for a smaller program

based on federal matching funds and probably not tied in with any long term commitment.

INDUSTRIAL BRIEFS

Correction . . . Ajax Engineering Corp., Trenton, N. J., wishes to correct a temperature figure which was given in their advertisement in *THE IRON AGE*, April 7. The statement read that the temperature of the melt is held at 870°F. It should have been 1170°F.

Made a Buy . . . The Scaife Co., Pittsburgh, has purchased the Timken-Silent Automatic Div., Rockwell Spring & Axle Co. The purchase places Scaife in the consumer product field.

Under Lease . . . The government's alcohol butadiene plant, Louisville, is under lease to the Publicker Industries, Inc., Philadelphia, for \$6 a ton rental. The plant, idle since last August, has an annual capacity of 60,000 short tons. It will begin operating shortly.

Foreign Front . . . Exploitation de Produits Industriels, S E P I, Paris, France, has been designated exclusive sales representative for CDE Control Services, Inc. Territory will include France, French North Africa, West Germany, Italy, Luxembourg, Belgium and the Netherlands.

Will Handle . . . Robert Warnock Co., Birmingham, has been appointed sales representative by the Bloom Engineering Co., Inc.

Distributor . . . Brooks & Perkins, Inc., have designated Continental Metals, Inc., 7001 Santa Monica Blvd., Los Angeles, their West Coast distributors of magnesium mill products.

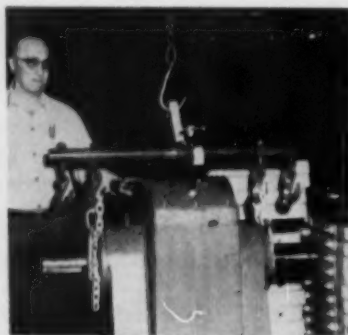
Out West . . . Gas Machinery Co. has appointed Heat & Control, Inc., San Francisco, as its representative on the West Coast for the firm's Industrial Furnace Div.

Represents . . . William H. Muller & Co., Inc., has named Ralph H. Irwin to handle their sales of iron ore, manganese ore, chrome ore, etc. Mr. Irwin is located at Henry W. Oliver Building, Pittsburgh.

Made a Change . . . The eastern regional sales office of the Alloy Tube Div., Carpenter Steel Co., will be located at the home office in Union, N. J. Paul E. Kelly continues as Eastern regional sales manager.

Dedication . . . Ford Instrument Co., division of the Sperry Corp., observed its 40th anniversary recently by dedicating a permanent company museum illustrating progress in the science of weapons control since 1915. Ceremonies took place at the Thomson Ave., Long Island City plant.

In Agreement . . . Twin Coach Co. will purchase all of the outstanding stock of Davey Compressor Co. There will be an exchange of stock certificates whereby Davey shareholders will receive Twin Coach stock for their equities.



Home-made rig to lift heavy gears was developed by National Supply employee Joe Ketcham.

Subsidiary . . . Kaiser Engineers International, Inc. has been formed to supervise engineering and construction projects in South America. J. E. Hughes is vice-president and project manager and Paul J. Havas is assistant to the vice-president. The firm will be located in Buenos Aires, Argentina.

Forms Firm . . . Edward J. Mogol and Hearne E. Neely recently announced the formation of Astubeco, Inc., 53 Park Place, New York City. Warehouse stocks include: Boiler tubes, welding fittings and flanges, stainless tubing, pipe and fittings.

Golden Anniversary . . . McGill Mfg. Co., Inc., Valparaiso, Ind., is observing its 50th anniversary this year. The company, serving the electrical industry, also has a bearing manufacturing division.

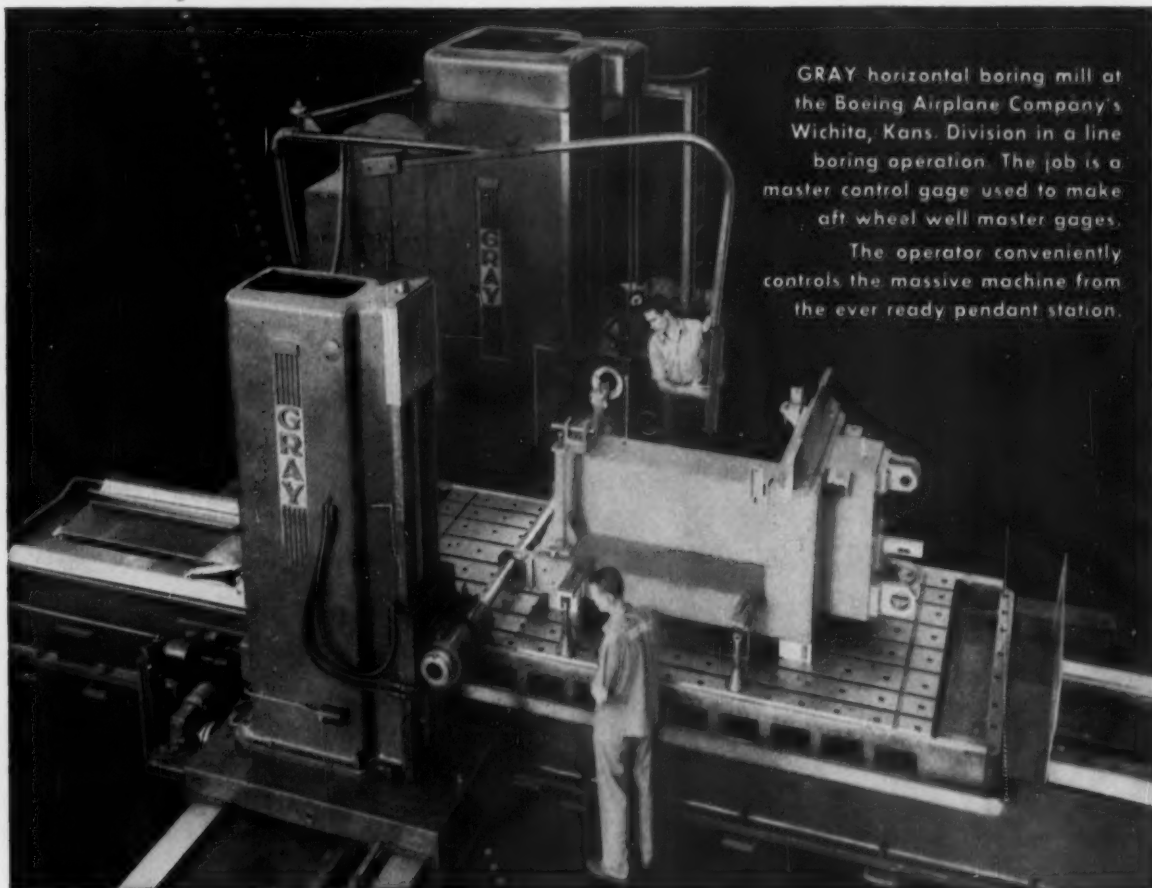
Safety Record . . . A-P Controls Corp., Milwaukee, recently won special recognition for its safety record. During ceremonies at the plant, an engraved plaque was presented to the company's president, Mr. Roy W. Johnson, by Employers Mutuals of Wausau.

Under Consideration . . . The proposed consolidation of Durez Plastics & Chemicals, Inc., with Hooker Electrochemical Co. will be under consideration at a special meeting in late April.

Fellowship Offered . . . Westinghouse Electric Corp. and the University of Pittsburgh are offering college graduates a program whereby part-time study will be conducted at the University and at the Bettis atomic power development laboratory in Pittsburgh, operated by Westinghouse for the Atomic Energy Commission.

BATTING .000 IS TOPS IN THIS LEAGUE

That's why Boeing uses a GRAY 6" BORING MILL. The ultimate in precision is needed to line bore the master control gages that will be used to make master gages for B-47 Stratojet Bombers. Work of this type must be absolutely right—hitting .000" accurately and quickly is imperative—that's why a GRAY was the logical choice. GRAY's high precision, convenience, and modern speed is saving production dollars in hundreds of shops. Whatever your requirements—a GRAY will do the job—better—faster.



GRAY horizontal boring mill at the Boeing Airplane Company's Wichita, Kans. Division in a line boring operation. The job is a master control gage used to make aft wheel well master gages.

The operator conveniently controls the massive machine from the ever ready pendant station.

Write today. Get
the story on

HIGH
low cost
PRODUCTION

The G.A. **GRAY** *Company*

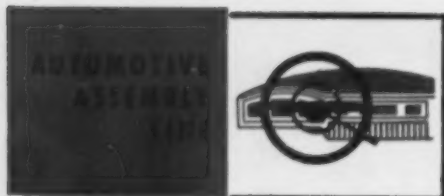
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planer type milling machines
horizontal boring machines

CINCINNATI 7, OHIO, U. S. A.

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April 21, 1955

63



Research Solves Glass Problems

Glare and radiation are absorbed by tinted glass . . . Night driving conditions easily met . . . Wraparound windshields resulted in distortion and production problems . . . Glass demand jumps—By T. L. Carry.

♦ Trend in auto design toward more and larger areas of visibility in cars has greatly increased the use of glass and has magnified the problems of glass producers. Glare and radiation from the sun are two of the problems that have plagued automotive glass engineers.

How these problems were solved was explained to the Society of Automotive Engineers at a recent meeting in Toledo by Dr. George B. Watkins, director of research at Libbey-Owens-Ford.

The company developed a tinted E-Z-Eye safety plate glass which reduces glare, filters ultra-violet and infra-red rays and still gives a high degree of visibility. Regular safety plate glass transmits 70 pct of the sun's ultra-violet rays and 73 pct of the infra-red rays. The E-Z-Eye glass filters out 54 pct of the ultra-violet and 68 pct of the infra-red rays. Daylight visibility in safety glass is 88 to 90 pct and 73 to 75 pct for the heat absorbing glass.

When first introduced, it was frequently stated that the tinted glass was not safe for night driving because it hindered visibility. Dr. Watkins said many people confused the color of the glass with that used in sun glasses. Tests at the General Motors proving ground in Milford showed that the difference in night time visibility between regular and tinted glass was 3 pct, or 9 ft in a distance of 300 ft.

Change Colors . . . The tests also showed that the difference in seeing distance occurred only at

the instant of "threshold seeing" while an object on the road was just coming into view. If a car was traveling at 50 mph, the driver with a tinted windshield would have to slow down only 1½ miles to make his vision equal to that of a driver with a regular safety glass windshield.

The first tinted windshield developed at Libbey-Owens-Ford had a bluish-green shade above the driver's normal vision line. This neutralized glare from the sky and eliminated the necessity of an outside visor on the car. This in turn gave body designers more freedom in their designs. Now the company uses a neutral blue shade which, in addition to eliminating sky glare, accentuates the red and yellow colors in traffic lights.

Panoramic Problems . . . Curved glass for panoramic windshields presented even greater problems



"Lucky seventh . . . Stand up."

to producers. The first panoramic windshield glass was made by hand at Libbey-Owens-Ford during World War II for an experimental car developed by the GM styling section.

Previous to that a small amount of curved safety glass was made but also by hand. When it was decided to use panoramic windshields on GM's cars, it was necessary for Libbey-Owens-Ford to widen production lines to accommodate the larger glass. In addition, new bending furnaces had to be constructed and bigger warehouses built.

Poor optical qualities also had to be overcome. Distortion at the bend in the windshield had to be corrected in order to meet automotive safety requirements. Numerous trials and errors, dimensional adjustments and road tests were conducted before the results were satisfactory.

Public acceptance of the windshields has been enormous. One of the company's large automotive customers uses more than 1 million sq ft of glass a day. The increased demand has led the company to expand its facilities. The building program, which will be started soon, will cost \$25 million.

Torsion Truck Seat Developed . . . A new type of truck seat that features a torsional rubber spring suspension system has been introduced by the Bostrom Manufacturing Co., Milwaukee. The seat eliminates to a large extent the jolts and shocks that cause back and kidney ailments commonly suffered by truck drivers. The

BULLARD

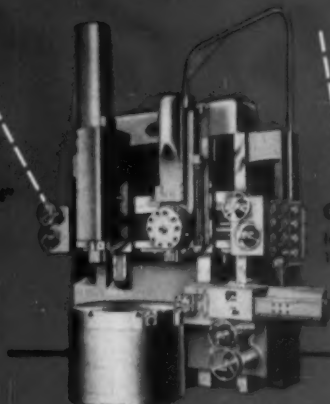
offers You Tomorrow's Machine Tools . . . Today

New products, methods, materials and cutting tools have out-dated many machine tools still in use. If your plant is operating under this handicap, it is important that you investigate the completely new line of Bullard Machine Tools.

Just call your nearest Bullard Sales Office or Distributor or write The Bullard Company, Bridgeport 2, Connecticut. Telephone EDison 6-2511.

MULT-AU-MATIC Type "L"

10" with 6, 8, 12 or 16 spindles, 14" and 18" with 4 or 8 spindles.

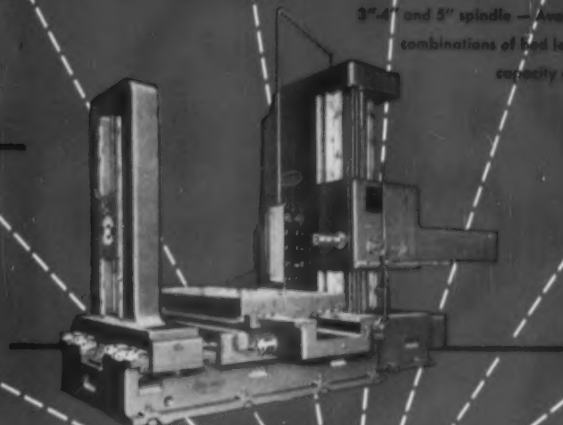


CUT MASTER V.T.L. Model 75

In 9" class, 26" to 76" table diameters in 10" increments. Various combinations of heads are available.

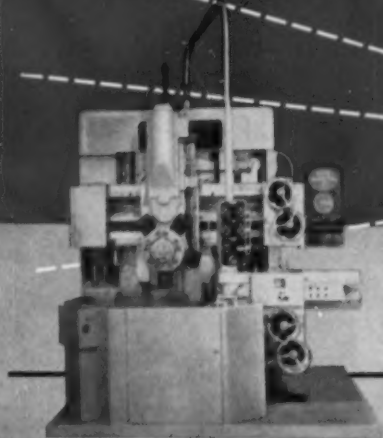
HORIZONTAL BORING, MILLING AND DRILLING MACHINE Model 75

3"-4" and 5" spindle — Available in many combinations of bed lengths, vertical capacity and table size.



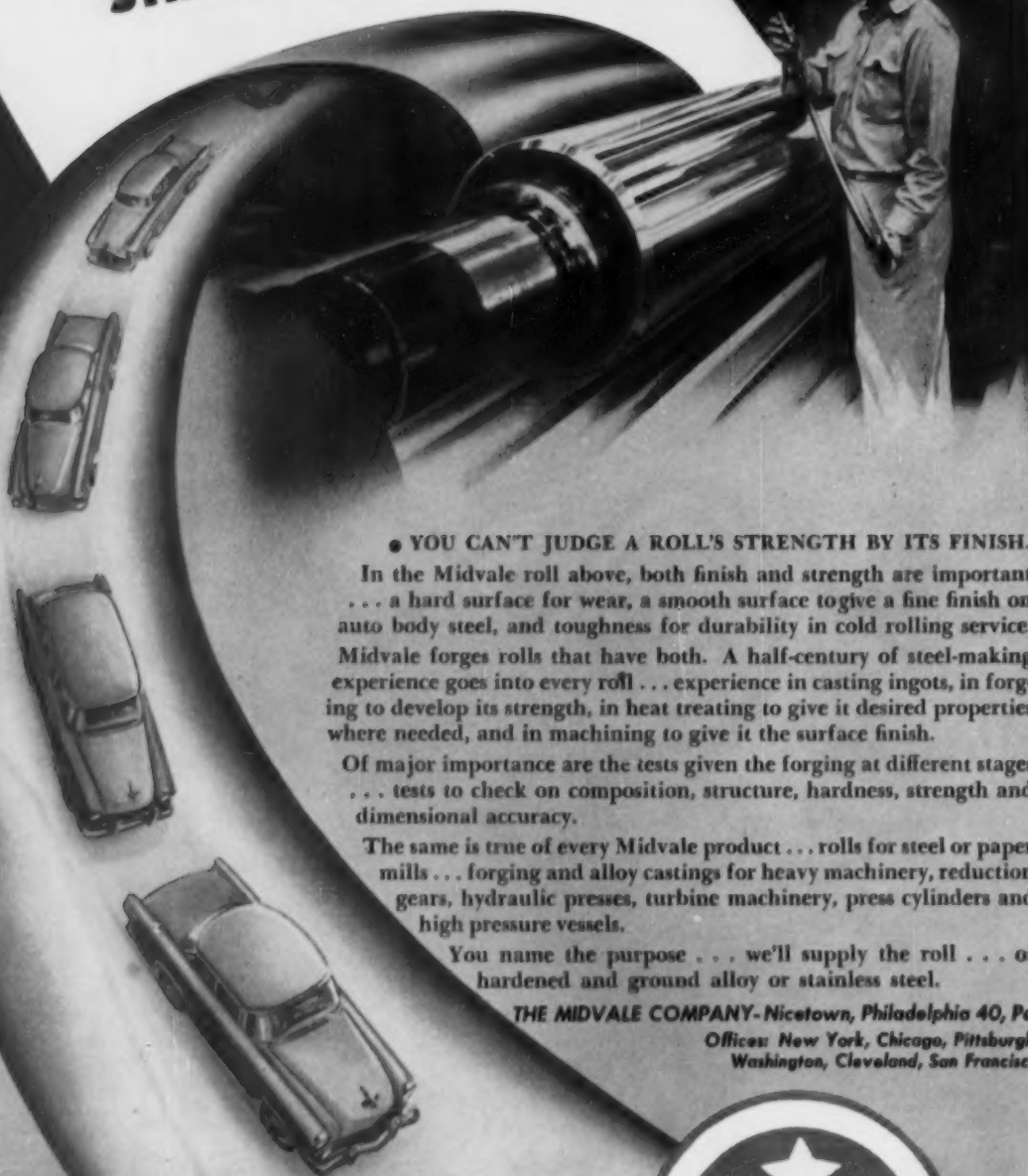
MAN-AU-TROX Model 75

For fully automatic operation — may be applied to any or all heads of Cut Master V.T.L. Model 75 at time of ordering or in subsequent at a later date.



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FORGED TO GIVE CARS STRONG BODIES



• YOU CAN'T JUDGE A ROLL'S STRENGTH BY ITS FINISH.

In the Midvale roll above, both finish and strength are important . . . a hard surface for wear, a smooth surface to give a fine finish on auto body steel, and toughness for durability in cold rolling service. Midvale forges rolls that have both. A half-century of steel-making experience goes into every roll . . . experience in casting ingots, in forging to develop its strength, in heat treating to give it desired properties where needed, and in machining to give it the surface finish.

Of major importance are the tests given the forging at different stages . . . tests to check on composition, structure, hardness, strength and dimensional accuracy.

The same is true of every Midvale product . . . rolls for steel or paper mills . . . forging and alloy castings for heavy machinery, reduction gears, hydraulic presses, turbine machinery, press cylinders and high pressure vessels.

You name the purpose . . . we'll supply the roll . . . of hardened and ground alloy or stainless steel.

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MIDVALE



FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Apr. 16, 1955	186,487*	32,798*
Apr. 9, 1955	176,554	30,535
Apr. 17, 1954	125,645	22,914
Apr. 10, 1954	128,058	24,016

*Estimated Source: Ward's Reports

seat's suspension isolates the driver from most of the road vibration.

Tension on the springs is adjusted to an individual driver's weight by turning the knob of a calibrated gage. The seat will accommodate weight adjustments from 100 to 275 lb. Pre-loading the springs helps to isolate most of the road vibration. Bostrom engineers say prior attempts to create suspension seats were never completely satisfactory because they were not adaptable to the varying weights of drivers.

The Bostrom Co. said road tests of the seats showed improvement in a driver's ability to operate his truck efficiently over long periods. When protected from excessive vibration, drivers proved more alert and better able to respond.

Expand Farm Line—In a bid for a bigger share of the farm machinery business, the Tractor and Implement Div. of Ford Motor Co. has added three new tricycle tractors and front-mounted implements to its line. One of the major features of the tricycle models, the first ever built by Ford, is power spread rear wheels. Usually a manual operation, the desired spacing of the wheels is obtained by using the tractor's own power.

Show First Profit

Studebaker-Packard Corp. earned a profit in March, the first to be recorded since the two companies merged last year. The announcement was made by James J. Nance, president of the company, in a progress report to executives of the two divisions. Among the factors that Nance cited for Packard's profit were torsion suspension development, new styling and 260 hp engines. He said Packard

sales are 167 pct greater than a year ago at this time.

Studebaker production and sales have also shown substantial increases. New manufacturing methods have been introduced to bring costs in line with competition. In the first 3 months of this year the combined unit sales of Packard and Studebaker were 71 pct over the same period a year ago. Both divisions are moving ahead with greatly intensified sales programs.

Ford Stock:

It may hit the market in June.

Speculation has again increased that non-voting stock in the Ford Motor Co. will be offered to the public soon by the Ford Foundation. Ernest R. Breech, chairman of the board, announced that the company expects to publish its financial report this year. This will be the first time that the firm's finances have been published since the company was founded in 1903.

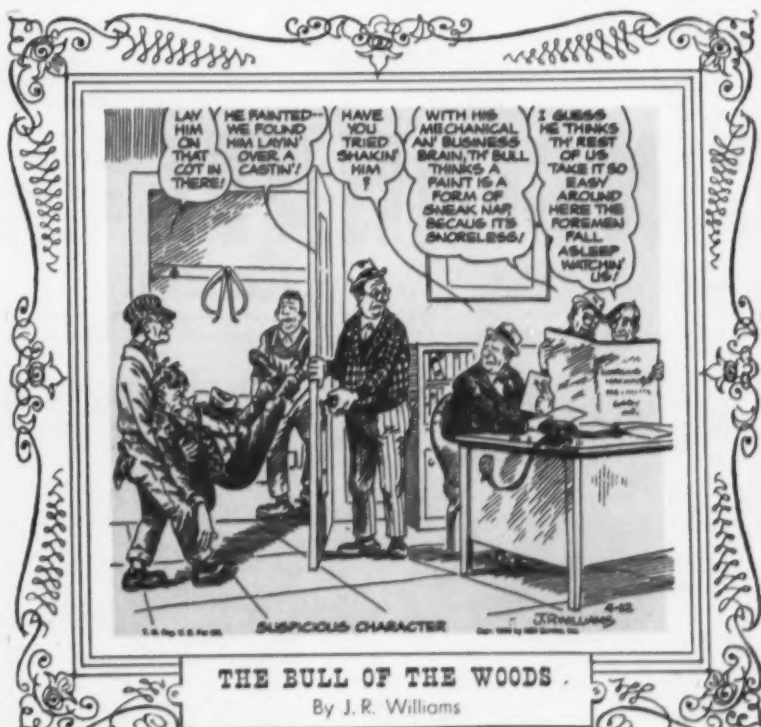
Mr. Breech did not say when the report would be made but it

AUTOMOTIVE NEWS

probably will be soon. The company's financial position would have to be made public before any stock offering was made. If, as previously reported, the Ford Foundation stock is to be sold in June, the financial statement will probably be made public in May.

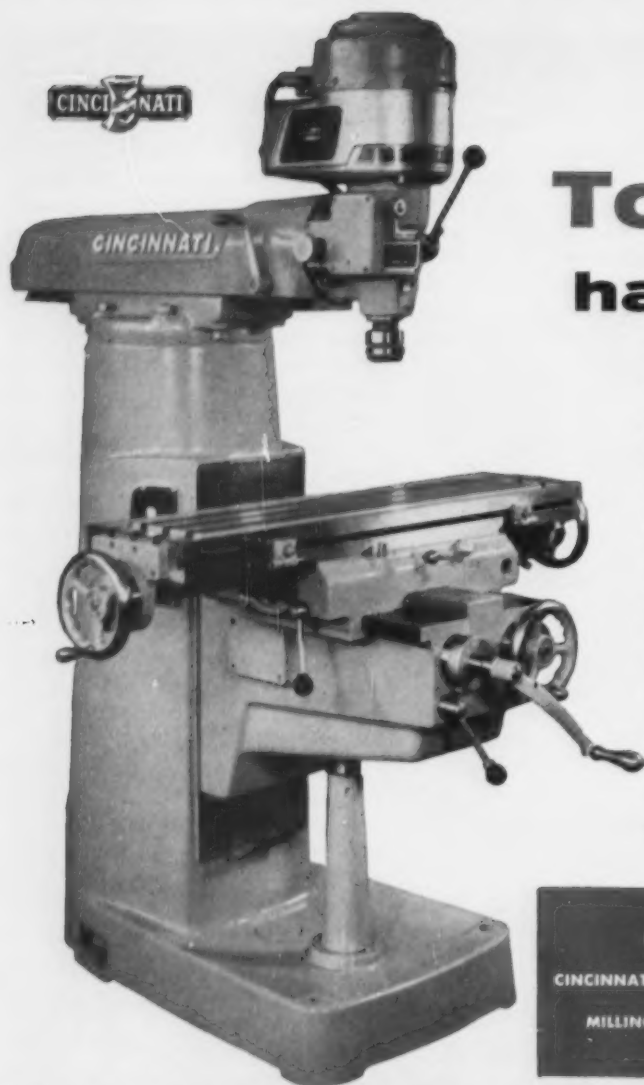
Most automotive insiders agree that Ford's financial position is enviable. The company's comeback since 1946, when it was losing \$10 million a month, is nothing short of phenomenal. Mr. Breech said that the financial policies have been exactly the same as they would have been if Ford had been held accountable by hundreds of thousands of stockholders.

He left little doubt that the financial details of Ford's operations will show that the company is in a very sound condition. So, when the Ford Foundation offers part of its 3 million non-voting shares to the public, it won't be because the company needs the money.



THE BULL OF THE WOODS

By J. R. Williams



The new Toolmaster has everything

... and there's a good reason. Before a single drawing was put on paper, our market research engineers went into shops everywhere, asking what was wanted in a small manual feed toolroom milling machine. Operators, tool engineers, machine tool buyers, maintenance supervisors ... all had a voice in the design of the new CINCINNATI Toolmaster. Yes, there's a very good reason why these new milling machines have everything desired for fast, low-cost milling operations in toolrooms, contract shops, tool and die shops, repair departments, and others. Just take a look at the three typical features illustrated below. They were operator-approved in actual field tests; management-approved in cost-of-production records. Would you like to have more information? Just write for new four-color catalog, No. M-1870-2.

**THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO**

**NEW
CINCINNATI TOOLMASTER
MILLING MACHINE**

Built in three styles:

1A—Manual feed
to quill, 1 hp motor
1B—Power feed to
quill, 1 hp motor
1C—Heavy duty
head, 2 hp motor

Range:

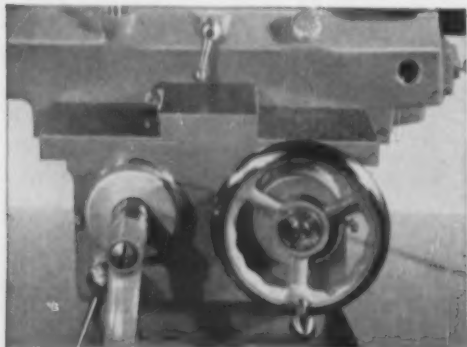
16" table traverse
10" cross
17" vertical

CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING
MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Extra Wide Knee

Has two advantages: wide square gibbed bearing ways for maximum strength; narrow guide for smooth cross adjustment.



Shaping Attachment

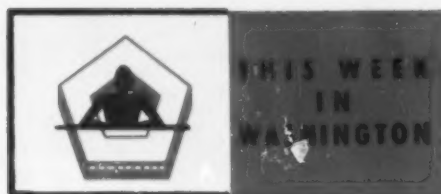
Jobs that would often be assigned to another machine can stay right on the Toolmaster with the ruggedly-constructed Shaping Attachment.



Oil-Shot Lubrication

Saddle-table parts and way bearing surfaces are lubricated from centralized oil-shot system.





See Push for Price Control Power

ODM gains ground in fight for U. S. control authority . . . Wages, prices, credit would be subject to regulation . . . President's backing could swing passage but angry opposition forms—By G. H. Baker.

◆ **PRICE** control authority for the government is once again in the making, and may well become a reality in the weeks ahead.

The Office of Defense Mobilization, which long has contended that the federal government should be armed with authority to control prices, wages, credit, and rents, now appears to have won a substantial number of Congressmen over to its point.

As a result, price control authority may well be "slipped over" during the present session of Congress with a minimum of debate and fanfare, particularly so if President Eisenhower throws his weight behind the drive to win control power.

There are several indications that he will do so—probably employing as a spokesman any one of the several Administration officials who will testify soon before the Senate and the House as to the need for extending the Defense Production Act beyond June 30.

Would Freeze Profits . . . To metalworking and to the jobber trades, price controls will mean a freeze of profit margins, starting at the moment the Administration switches the control program into effect. It's the old idea of repealing supply-demand law.

A number of Senators and House members are prepared to fight against giving the White House any new control power. Senator Barry M. Goldwater, R., Ariz., declares he'll fight to the last ditch against any price control program. Says he: "I'm against controls of any kind at any time—standby, sit-down, or any other kind."

Help Little Fellow . . . New legislation is in the works which will provide a helping hand to smaller firms, and which may further restrict some operations of bigger firms. The move is sparked by a new House report on small business.

The report notes with alarm that large companies are making larger profits and smaller companies are earning smaller profits, and that the percentage of total sales of small business is shrinking.

The form and shape of the corrective legislation has not yet jelled, but it is now known that a number of Congressmen are prepared to vote for laws to keep manufacturer-controlled sales outlets from competing unfairly with independent dealers, and also to step up the drive in getting the government out of competition with private business. Idea is for both poor and rich to grow.

Summarizing technical information on precision casting of metals is a new, 27-page report sold by the Office of Technical Services, U. S. Commerce Dept.

Title of the publication, which sells for 75¢, is "Investment Precision Casting." It describes preparation of dies and patterns, molding methods, compositions used, investment, and heating and melting methods under today's condition.

Toolmakers Protest . . . Tool and die makers are protesting another form of government competition. Too many large prime contractors, they say, are making their own tools and dies with government-owned equipment instead of ordering their tools and dies from tool and die producers.

As a result, the loss of outside orders has been substantial, and the industry asks Commerce Sec. Sinclair Weeks to eliminate or at least tone down this kind of government-inspired competition. It's not an easy problem to solve, but Sec. Weeks is hopeful of getting some assurances from big government contractors that they'll make an effort to farm out more tool and die work. Free cooperation may or may not be the answer.

See Atomic Planes . . . Atomic-powered aircraft are just over the horizon, military officials reveal. The appearance of the first A-

What's New in Casting

Designated by OTS as PB 111001R, the report includes a 192-item bibliography.

The agency also is selling a 12-page publication, dated 1954, entitled "Correlation List of American and European Composition of Stainless Steel." This list compares standard American Iron and Steel Institute compositions with the principal European steels, by manufacturer, in eight countries. Price of the list is 50¢, and its order number is PB 111549.



Flash butt-welding of mill-rolled sections will save \$186,888.00 this year for one jet engine manufacturer

By designing the mill rolled section shown above, instead of using a rectangular bar, 98 lbs. of metal per ring was saved. The cost of fabricating rings was reduced \$77.87 per ring.

Are you using machined rings or bands? Rolling and flash butt-welding of special mill-rolled sections may be able to effect similar economies. Write today for complete information. Our Product Development Division will be glad to work with you.

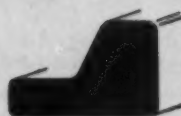
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TYPICAL STAINLESS MILL ROLLED SECTIONS



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powered airplane will mean the start of a broad new procurement program for the revolutionary planes and the many complicated component parts required in manufacture.

Pentagon research chiefs disclose that they have assigned the highest military priority to development of A-planes. No details are being unveiled by the military at this time, but it is now apparent that the A-aircraft would have an almost unlimited range of flight. Details as to specifications and performance remain tight secrets.

Back Overseas Trade

Overseas investment and sales of six U. S. firms are to be assisted by new guarantees and credit lines established by the government.

Socony-Vacuum Oil Co., is obtaining investment insurance from Foreign Operations Administration to permit the firm's Italian subsidiary to install a new catalytic cracking unit. The guarantees, totaling nearly \$11 million, are to insure that Socony-Vacuum will get its profits out of Italy and to protect the company against expropriation.

New credit lines opened by Export-Import Bank of Washington to aid in foreign sales of capital goods aggregate \$19.1 million. Companies, amounts, and products affected are:

General Motors Overseas Operations, New York, a division of General Motors Corp., was allotted \$10 million. Sum covers diesel-electric locomotives, diesel engines and generators, commercial refrigeration equipment, earthmoving machinery, trucks, and buses.

Deere & Co., Moline, Ill., received a \$7.6 million credit covering farm tractors and farm machinery and implements.

Fields New AEC Head

Brig. Gen. K. E. Fields, director of military application for the Atomic Energy Commission, is retiring from the Army to become the new AEC general manager, effective May 1.

He has been associated with the atomic energy program since 1945,

except for two short tours of duty with the National War College and the Military Defense Assistance Program. In his new job, he will succeed Maj. Gen. K. D. Nichols, who is resigning to enter private business as an engineering consultant.

Fields, a native of Elkhart, Ind., was commissioned in the Corps of Engineers in 1933. He has held peacetime posts in the New York and Jacksonville, Fla., engineer districts and at Vicksburg, Miss. He served in Europe during World War II.

His education includes graduate study at Massachusetts Institute of Technology and at Harvard.

A-Power:

New licensing rules ease private use.

Government officials are opening the door a little wider to admit private industry into the nuclear energy use field.

Newly proposed by Atomic Energy Commission are three regulations putting into practical form the provisions of the Atomic Energy Act of 1954. Areas covered by the regulations are the issuance of licenses to use production facilities, licensing for possession of special nuclear materials, and protection of classified information.

Proposed regulations cannot take effect until the public is given 30 days in which to offer comment,



"Five dollars says you don't make it."

WASHINGTON NEWS

following publication of the proposals in the *Federal Register*. After suggestions and comments have been considered, the final regulations will appear in the same publication.

As viewed by the AEC, these rules give prospective industrial participants the basic facts they need to apply for entry into the atomic power business. Now being revised by AEC are other rules governing source and by-product materials.

Still to come are regulations over administrative procedures and health and safety. Essential purpose of all these regulations is to reduce the government monopoly on nuclear energy knowledge.

Name Rules

Facilities to be licensed under the newly-proposed rules include all reactors, gaseous diffusion and other isotope separation plants, chemical processing and fuel element fabrication plants. Only complete production or utilization plants are affected.

Basic requirements for safeguarding secret and confidential data are established by the third proposed regulation. AEC will give special instructions to cover top secret information.

AEC licensing controls over the export of component parts of atomic utilization or production plants are to be ended by the proposed rules. However, a license from the agency still will be needed when export of a complete plant is planned.

Doom Trade Plan

A State Dept. plan to add 21 trade commissioners in foreign countries to help U. S. businessmen increase their overseas business won't go through if Congress accepts the House Appropriations Committee's recommendations.

Committee turned down the Department's request for \$600,000 to hire and place trade commissioners in Europe, Latin America, the Near East, Australia and Africa.



here's why **LINE-ARC** contactors are industry's first choice



No Destructive Arc Shield Burning

Arc is a line centered between, but not touching, the arc shields.



Quick Removal of Hot-Arc From Contacts

As contacts separate, arc is transferred in 1/500th of a second from contacts to arcing-plate and circular guard over the blowout coil. Result is cool contacts . . . and cool contacts last longer.



No Lubrication-Maintenance

Self-lubricating bearings on main and auxiliary arms eliminate often overlooked lubrication-maintenance.



Magnetic Dust Problem is Licked

New Magnetic circuit is unrestricted below the air gap.

Magnetic dust is free to fall, because there is no mechanical shelf to catch dust, it does not pile up in air gap nor pack-in (requiring manual removal).



Safer Electrical Interlocking

Double-break coin-silver contacts with normally-open circuit insulated from normally-closed circuit, no carry over from one to the other by an arc.

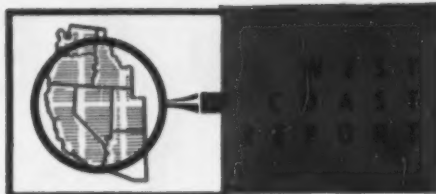
These Contactors are a tribute to sound engineering design. They have proved themselves in the severest crane and mill service. They respond quickly, due to the light-weight arm construction, handle the arc scientifically, and have long life. The high efficiency and lower upkeep of EC&M "LINE-ARC" Contactors are good reasons for specifying EC&M Magnetic Control for Cranes and auxiliary mill drives.

Write for Bulletin 1145-E.



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West Lags in Atomic Power Use

Vast sources of information available at AEC . . . Even restricted data open to some commercial uses . . . But area lags in applying atomic power developments . . . Douglas uses TV in tooling—By R. R. Kay.

♦ ANYONE in the dark about industrial possibilities of atomic energy may be surprised to learn the light isn't too hard to find. There's a lot more information now available on the subject than most businessmen realize.

From the present pile of unclassified literature alone, an executive can get a good idea of the current status of nuclear developments—and what it might mean to his firm.

And if the easy-to-get first peak looks good, the Atomic Energy Commission has made it fairly easy for a company or individual to investigate further. Even restricted data now is open to "commercial interests" who prove a reasonable ability to use it.

Encourage Use . . . West Coast executives perked up when Charles G. Manly, acting chief of AEC's reactor development division's industrial liaison branch, warned that the western states are lagging far behind the rest of the country in applying atomic power developments.

"I would like to encourage you to face the problems and opportunities you have not yet begun to tackle and to grasp the opportunities that are presented. The atomic energy industry is in its infancy."

Mr. Manly spoke at an industrial atomic energy conference in San Francisco, first of its kind ever held in the West. It was sponsored by Stanford Research Institute and Atomic Industrial Forum—an organization of U. S. business firms that wants to advance

atomic energy for industry use.

Some highlights of the two-day confab:

V. P. Guinn, Shell Development Co., said, "The wear rate of gears, piston rings, wire-drawing dies, and cutting tools has been investigated by radioactive means." The method rapidly detects as little as 0.01 mg of metal worn off a gear.

Dr. W. C. Rueckel, vice-president, Kaiser Engineers, Div. of Henry J. Kaiser Co., said, "Atomic energy's problems for the engineer are fundamentally the same as those which had to be solved throughout the years in metals, oil, and other industries. These problems are basically mechanical, electrical, chemical, and metal-

lurgical."

North American Aviation's reactor in southern California was reported scheduled for January completion. It will develop 20,000 kw and will serve as a model to iron out bugs expected to crop up in the initial stages.

TV Tooling . . . Standard industrial television parts aid man's eyesight to increase accuracy of the assembly jigs on which Douglas Aircraft's DC-7C is being built.

The system uses telescopes and targets for the optical reference lines from which parts of the jigs are positioned. The TV camera, looking into the eyepiece of the telescope, picks up reference points.

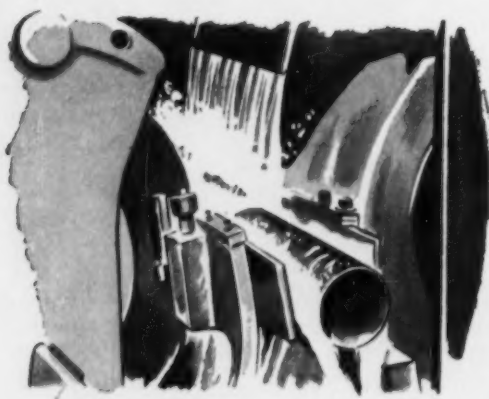


STEELWORK for an additional lane of traffic over the Toulume River south of Modesto, Calif., was fabricated and erected by Bethlehem Pacific.

New S.E.C.O. is Tops For These Operations



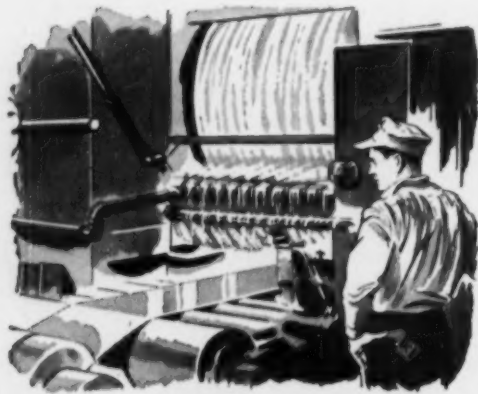
CUTTING WITH NEW S.E.C.O. Tools stay cool—require less frequent grinding. Finishes are uniformly good.



GRINDING WITH NEW S.E.C.O. Surface finishes are good. Loading and glazing of wheel are reduced—wheel life is prolonged.



WASHING WITH NEW S.E.C.O. Thorough removal of grease and dirt provides clean surfaces for smooth, long-lasting finishes.



ROLLING WITH NEW S.E.C.O. Rolls stay clean. You get maximum reductions and low power consumption.

New Sunoco Emulsifying Cutting Oil increases production, cuts operating costs. Its high machining efficiency permits uniformly good finishes, prolongs tool life. Its high detergency and purity keep tools, parts and machines clean. Its excellent mixing qualities permit its use in cold, hard or hot water. Test New S.E.C.O. in your own plant. For more information, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. IA-4.

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Refiners of famous High-Test Blue Sunoco Gasoline



Performance Needs Clash With Style

New handling and control devices break up machine lines . . . Buyers are talking production and maintenance more today . . . But clean design and shiny surfaces are still sales assets—By E. J. Egan, Jr.

♦ **AUTOMATION** trend isn't likely to make "objets d'art" out of machine tools. According to B. D. Smith, general supervisor of engineering research for International Harvester Co., machine tool styling and streamlining won't be too compatible with efforts to increase automation efficiency and economy.

Smith told an American Society of Mechanical Engineers machine design conference at New York University that "Until recently, engineers and buyers insisted on steamlining and styling in machine tools." But with the trend toward increased use of automatic machinery, he noted that users seem more willing to sacrifice styling for emphasis on machine performance, work handling, safety and maintenance.

Question Beauty Value . . . Just how much influence machine tool appearance has on salability is debatable. Most builders will insist that no one ever bought a machine tool just because it looked pretty. And they'll buttress this contention by saying that after a few weeks of hard shop use, even the handsomest piece of equipment becomes simply another oil-smearred, chip-scarred production tool.

On the other hand, no builder would think of displaying or shipping a machine tool "in the rough." Without a final coat of shiny paint and a full set of chrome plated accessories, neither a metalworking machine nor a 1955 automobile would win any prizes for eye appeal.

Apparently it's only human na-

ture to make the modern utility item as appealing as possible, regardless of whether it's a machine tool or a floor mop. Even the most emphatic I-don't-care-what-it-looks-like-as-long-as-it-does-the-job attitudes have been known to soften at the sight of especially trim machine designs.

Clean Lines Count . . . At conventions and expositions, cost-conscious machine tool buyers have actually been heard to murmur such expressions as "neat job" and "sharp looking" as they studied attractive equipment displays. And they have also been heard to comment on equally efficient but less streamlined machinery as being "crude," or "looks like it had been thrown together."

As Mr. Smith predicts, automation will make a difference in design. Loading, unloading and

other work-handling devices will have to be attached to machine tools in the most efficient way; similarly with automatic gaging equipment and miscellaneous control elements. And it will be difficult to blend these accessories into an eye-pleasing whole.

But human nature and competition being what they are, builders will still try to avoid a cluttered-up look as much as possible.

Need Wider Range . . . Speaking about another aspect of machine tool design, Mr. Smith said that designers will have to build more versatility into equipment intended for sale in plants where short part runs are the rule. He noted that larger machine tool builders tend to concentrate on high-production, special-purpose equipment, and that smaller builders "are hesitant to risk costly engineering effort in low production areas without the assurance of financial support."

Builders' natural reluctance to work out mechanization problems for short runs and quick setup changes must be overcome, he said. But he indicated that much of the initiative must stem from the end product manufacturer.

The 1955 Fabricating Machinery Hydraulic Conference, sponsored by Vickers, Inc., will be held May 17 and 18 at the Hotel Statler, Detroit.

Conferees invited will include representatives from manufacturers and users of metalforming machinery, die casting equipment, presses, welding machinery and plastics injection molding equipment.



"Oh, yes, I have learned a lot from you . . . and its all in this can."

PERSONAL CONTACT

...that's the secret of successful business



Canadian International Trade Fair

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See what the world has to offer in the way of new products—new ideas—new manufacturing techniques.

In Toronto, at the 1955 Trade Fair, you can meet manufacturers from many countries and discuss personally your needs. In a single day, you can compare the products of a dozen different suppliers, whether for your own use or re-sale. Every business man—employer or employee—is invited to attend the Trade Fair.

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8th Annual

CANADIAN International TRADE FAIR

TORONTO
CANADA
MAY 30th
TO
JUNE 10th
1955

YOUR GATEWAY TO WORLD TRADE



OPERATED BY THE GOVERNMENT OF CANADA TO PROMOTE YOUR BUSINESS



The Iron Age

SALUTES

Kenneth P. Bowen A willingness to strike out for new places and new methods brought him from England to California and made him a standout executive in an industry noted for bold young men.

When Ken Bowen takes off from California for a little salt water fishing, his family often wonders if the next word from him won't be by way of Hongkong. Because Ken is a free wheeling man with a westering way. He has packed great chunks of geography as well as aircraft history into 30 or so working years.

Ken is now vice-president in charge of production at Northrop Aircraft, Inc., Hawthorne, Calif., and is pleasantly situated in a ranch-type home in Santa Monica. He's now in an extremely enviable position, but it took plenty of get-up-and-go to get there.

Born 50 years ago in Hull, England, Ken was educated in English technical schools; went to work at 16 as an office boy for a British aircraft manufacturer.

In 1929 he made his first big move, crossing the Atlantic to America. He went into aircraft engineering for East Coast manufacturers and in 1935 he moved to California with North American. When World War II started, he was

named project engineer on the P-51 Mustang. Many of the design and production ideas incorporated in the P-51 were his, and when the plane went into quantity production, he mosied down to Dallas and became assistant factory manager of North American's Texas plant.

At the close of the war, Ken moved to Fairchild Aircraft Div., Fairchild Engine & Airplane Corp., as assistant general manager. Finally, in 1949, he came to rest at Northrop where he directs production of guided missiles and the Northrop twin-jet Scorpion.

Ken figures 70 pct of the cost of building planes is in assembly operations. He's always looking for the big savings that come with improved assembly methods. Right now he has a project for making large fuselage sections from a single sheet of alloy. A giant stretch press will do the forming.

At the close of a day's work, Ken takes his job home to Santa Monica. He calls marriage, U. S. citizenship his most decisive steps.

round the clock with CF&I-WICKWIRE WIRE

Let's take a look at a typical day in the life of John Q. Citizen—and of the part CF&I-Wickwire Wire plays in his everyday activities.



7:00 A.M.—BEDROOM. John's day starts with the ringing of his alarm clock. There's wire in the mattress and bedspring. In the lampshades and drapery hooks. Bobby pins, safety and common pins in his wife's dressing table—to mention just a few.



7:15 A.M.—NURSERY. Here's the crib from which young John helps the alarm clock to rouse his dad. No less than nine different kinds of wire go into its making. His toys and his tricycle, too—even the zippers on his clothes make use of CF&I-Wickwire Wire.



7:30 A.M.—KITCHEN. Let's inspect the kitchen. In the range and the refrigerator there are wire racks. The kitchen utensils, wire strainers, electric mixer, the egg slicer, the toaster, and dozens of other appliances all use CF&I-Wickwire Wire in their construction.



**FOR THE WIRE YOU REQUIRE
CHECK CF&I-WICKWIRE**

Watch for the balance of John's day in succeeding advertisements that take him to his office, through his plant and finally home to his living room.

CF&I-WICKWIRE WIRE

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2846

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The Iron Age INTRODUCES

L. S. Wilcoxson, appointed vice-president, Boiler Div., **Babcock & Wilcox Co.**, New York.

Wallace B. Leyda, named chief metallurgist, **Copperweld Steel Co.**, Marion, O.

C. Davis Blackwelder, appointed consulting engineer, Operations Div., **Reynolds Metals Co.**, Richmond, Va.

John Dewey, named Chicago branch sales manager, **Warner Electric Brake & Clutch Co.**

Ernest S. Wellhofer, succeeds **George C. Gregson** as plant manager, wire rope divisions, **American Chain & Cable Co.**, Bridgeport, Conn.

John N. Merkle, elected vice-chairman of the board of directors, **Franklin Balmar Corp.**, Baltimore. **Julius J. Kirchhof** succeeds Mr. Merkle as president.

L. H. Stringfellow, named vice-president, **Reliance Steel Co.**, Los Angeles. **Keith Chase**, appointed sales manager.

John S. Hutchins, named president, National Bearing Div., **American Brake Shoe Co.**, New York. **Thomas W. Pettus**, assigned to over-all railroad sales for the company.

R. B. Blythe, named assistant to the vice-president, **The Aro Equipment Corp.**, Bryan, O.

Ralph C. Herdrich, elected vice-president in charge of purchasing, **Rolled Steel Products Corp.**, St. Louis, Skokie, Ill.

Harvard C. Waken, appointed comptroller, **Pastushin Aviation Corp.**, Los Angeles.

Kenneth F. Leaman, appointed vice-president—manufacturing, American Bosch Div., **American Bosch Arma Corp.**, Springfield, Mass. **Harold R. Sennstrom**, named vice-president-product development.

Francis B. Makens, appointed general superintendent, Chicago plant, **Joseph T. Ryerson & Son, Inc.** **William G. Findlay**, appointed manager, Detroit steel service plant.

Dwight H. Renfrew, appointed chief engineer and **William A. Morley** as general superintendent, Philadelphia plant, **Link-Belt Co.**

Irving A. Painchaud, appointed design engineer, **Electric Furnace Co.**, Salem, O.

H. T. Peeples, appointed lubrication engineer, **Timken Roller Bearing Co.**, Canton, O., succeeding **Oscar L. Maag** who has retired.

Joseph J. Becka, appointed plant superintendent, **The Barth Corp.**, Cleveland.

Byron E. Grant, named assistant general manager, **Braden Copper Co.**, Salt Lake City, Utah.

PERSONNEL



M. NIELSEN, elected executive vice-president, **Babcock & Wilcox Co.**, New York.



EDWIN R. BRODEN, elected executive vice-president, **SKF Industries, Inc.**, Philadelphia.



FREDERICK W. THOMAS, appointed director of purchases, **Vanadium Corp. of America**, New York.



CHARLES E. BEAVER, elected a vice-president of **Research-Cottrell, Inc.**, New York.

Lynn G. White, appointed sales manager, Toolset Div., **General Riveters, Inc.**, Buffalo.

William A. McGill, appointed manager, work order department, Pittsburgh plant, **Joseph T. Ryerson & Son, Inc.**

Theodore W. Chase, appointed manager, coupling department, Metal Products Div., **Koppers Co., Inc.**, Baltimore.

J. O. Phillips, named assistant to executive vice-president—sales, **Heppenstall Co.**, Pittsburgh. **George H. Wurster**, appointed manager of forging and die steel sales.

L. D. Huffman, named director of engineering, **Colson Corp.**, Elyria, O.

F. L. Humphrey, Jr., appointed district manager, Atlanta, **Elliott Co.**

Herman H. Kuehike, elected chairman of the board of directors, **Richards & Conover Hardware Co.**, Kansas City.

Robert E. Navin, joined **The Hays Corp.**, Michigan City, Ind., as assistant to the executive vice-president.

Fritz C. Hyde, Jr., appointed sales manager, Standard Rolling Mills Div., **Revere Copper & Brass Inc.**, New York.

Fred S. Seybert, appointed chief product engineer, Brainard Steel Div., **Sharon Steel Corp.**, Warren, O.

George E. Little, appointed manager, machine products sales division, **J. B. Beaird Co., Inc.**, Shreveport, La.

William D. Gilder, becomes chief metallurgist, **Reed Roller Bit Co.**, Houston.



VINCENT E. LYSAGHT, appointed general sales manager, American Chain & Cable Co., Inc., New York.



C. I. YOUNG, named vice-president and general manager, Laclede-Christy Div., H. K. Porter Co., Inc.




WILLIAM C. FRENCH, JR., appointed manager of sales Chicago District, National Tube Div., U. S. Steel Corp.



FRED E. HARRELL, named president, Marquette Metal Products Co., Cleveland.



Everyone recognizes this
as a sign of spring . . .

And smart gear users know
this  is the sign of good gears
made to your specifications.

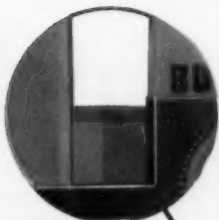
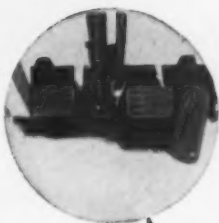
May We Send You Our Brochure?



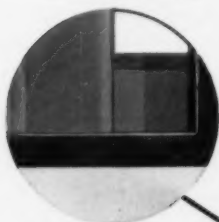
"Gears... Good Gears Only"

THE CINCINNATI GEAR CO. • CINCINNATI 27, OHIO

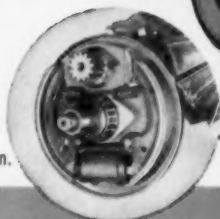
FAMILIAR CONTROLS
eliminate confusing one
for another, increase safety.



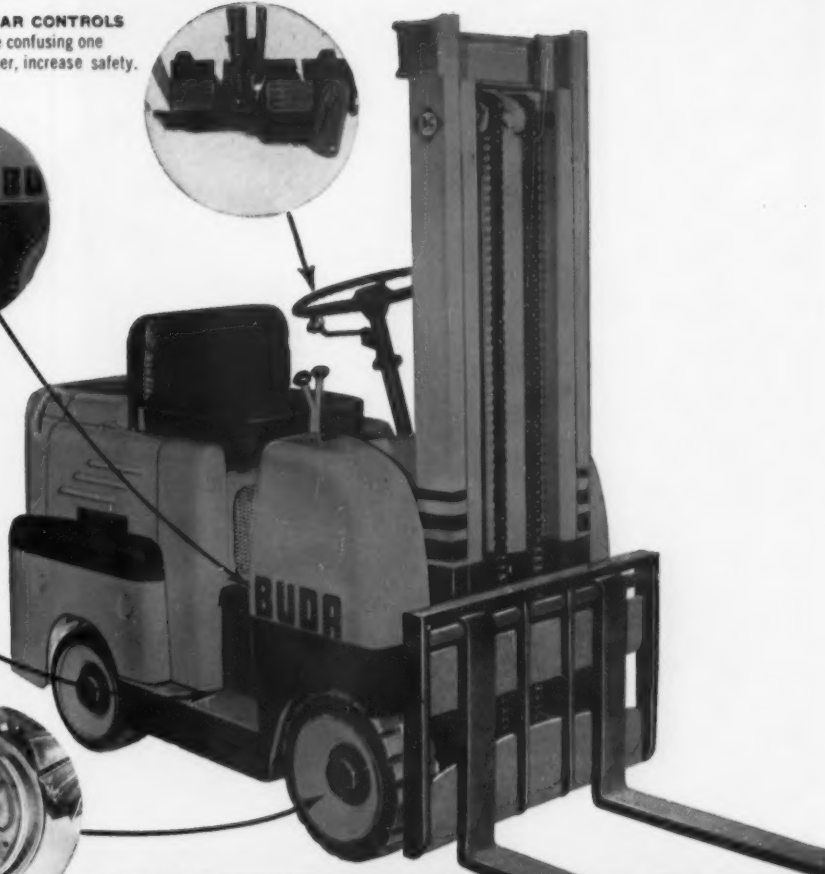
CLEAR FLOORBOARD SPACE
prevents tripping, aids
fast exit when needed.



WIDE LOW STEP
enables operator to get
off quickly from either side.



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self energizing in both
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BUDA

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THE SAFEST IN THE WORLD!**



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36 pages of the most interesting fork
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Your first step into a Buda shows you a built-in safety feature—the step is wide, low, built for fast exits in emergency! Sit in the wide seat. Look around. You have 360° clear vision! Look at the floorboard. No pedals jutting out to get in your way. Look at the controls—you have seen similar ones in your car—no chance to get them confused. Start up the Buda, whirl it—perfect stability with or without a load! Look at the slanted counterweights for safely ascending and descending steep ramps, the fuel tank set away from the engine, fingertip parking brake, literally hundreds of features that spell out safety. Yes, cut down accidents while speeding up production and do it with the Buda Fork Lift Truck, the *safest* in the world!



THE **BUDA** DIVISION

Allis-Chalmers Manufacturing Company
Harvey, Illinois

April 21, 1955



"This Warco's A Real Press" —

says experienced Press Operator

"I've worked medium and light presses for more than eight years," says press operator John Gallik, of the Midland Steel Products Co., Cleveland, "and this Warco 200-ton OBI is a real piece of machinery." Gallik's employers, the Midland people, one of the nation's foremost producers of automobile and truck frames, go along with the operator's opinion. Nine years ago Midland bought their first Warco, and on the basis of performance have since added 49 others in various types and sizes. Midland, like so many of the nation's top manufacturers, finds one Warco invariably leads to another, and their press operators are happy about it.



The Federal Machine and Welder Company
WARREN, OHIO

PERSONNEL

Karl Adler, named vice-president—sales, **Dumas Steel Corp.**, Pittsburgh.

Clare Saltz, appointed manager, Ordnance Equipment Div., U. S. **Hoffman Machinery Corp.**, New York.

Myles C. McGough, elected a vice-president, **Merritt-Chapman & Scott Corp.**, New York.

James D. Creamer, appointed sales representative, Indiana, **American Screw Co.**

Russell M. Wheeler, named chief engineer, **Seneca Falls Machine Co.**

James E. Fifield, appointed staff metallurgist, **International Selling Corp.**, New York.

Lester A. Edwards, appointed sales manager, **Cincinnati Gear Co.**

OBITUARIES

Fred Reese, metallurgist, Warehouse Div., **Atlantic Steel Co.**, Atlanta.

W. A. Roberts, 57, president, **Allis-Chalmers Mfg. Co.**, suddenly of a heart attack.

George G. Gries, 71, vice-president—sales, **Great Lakes Sales Corp.** Mr. Gries had been associated with Great Lakes since 1929.

Andrew J. Snow, manager of sales, Washington district, **U. S. Steel Corp.**

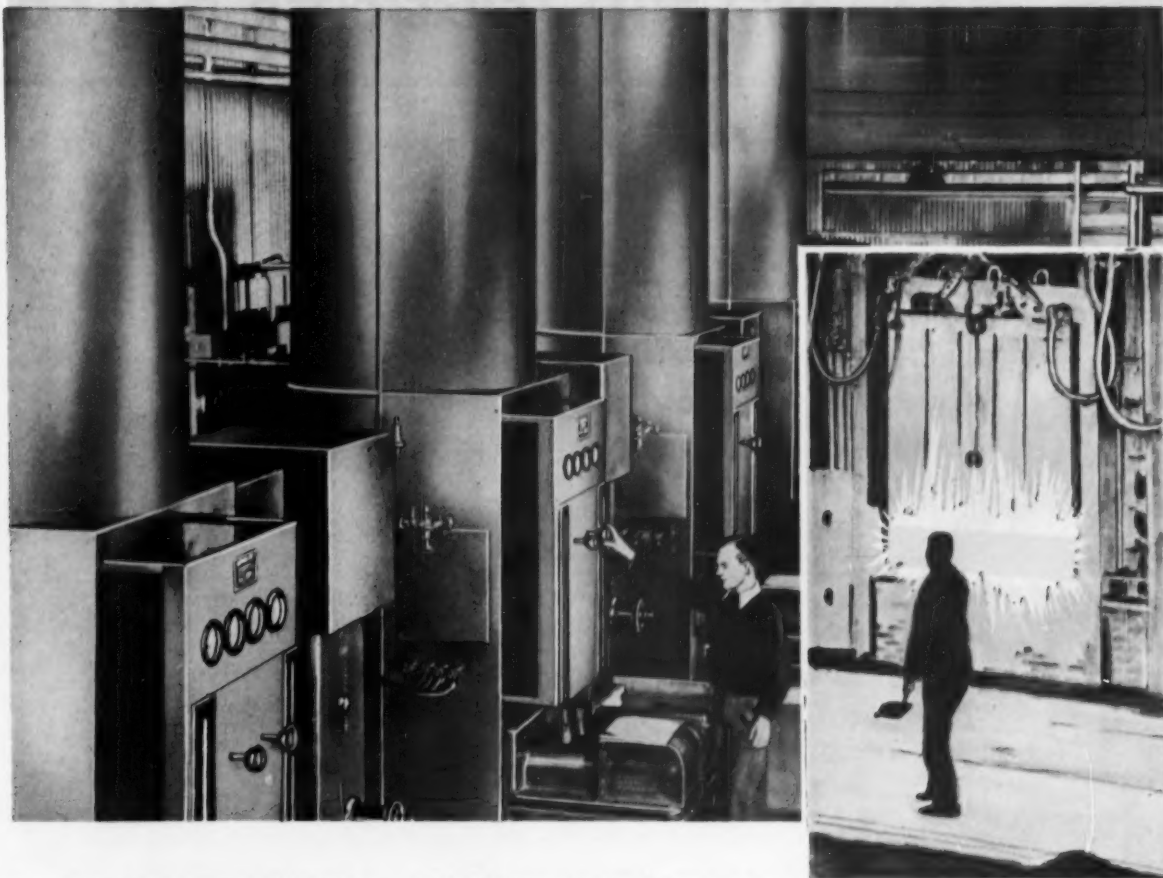
Walter A. Fletcher, sales manager, Western Div., **E. F. Houghton & Co.**, Notre Dame Hospital, San Francisco.

R. H. Schlottman, 66, comptroller and director of **Bethlehem Steel Corp.** and vice-president and comptroller of **Bethlehem Steel Co.**, while in Cuba.

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hand at the turn of a valve, for varying production or experimental needs

We can furnish equipment for all requirements whether they be:

AIR PRODUCTS TONNAGE GENERATORS for oxygen and nitrogen in unlimited quantities . . . standard or special models . . . high or low pressure cycles.

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Generators to produce any quantities at any purities and pressures.

Write, stating your requirements. We will give you actual figures showing savings you can make.

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April 21, 1955

Hendey NO. 2E LATHE WITH ELECTRONIC

simplifies lathe operation . .

**OPERATOR EFFORT IS REDUCED TO A MINIMUM
MACHINING EFFICIENCY IS INCREASED
16-7/16" SWING OVER WAYS
COSTS ARE CUT AT EVERY TURN**

Hendey electronic control of spindle speeds on No. 2E Precision Lathes is effortless with this convenient fingertip selector. It affords a quieter, more efficient drive, with closer control over speeds than is possible with other types, especially at the slower rates. Speeds are adjusted smoothly, either pre-set or while cutting, through the full range up to 1500 r.p.m. to give the most efficient cutting rate for the particular type of cut. Operating efficiency is further stepped-up by single-lever control of start, stop and reverse. Dynamic braking allows smooth and rapid changing from forward to reverse rotation of the spindle.

Additional Hendey quality features make this general purpose lathe a machine you should see before you buy any lathe . . . especially if you want maximum operating efficiency, work accuracy and reduced cost on turning operations.

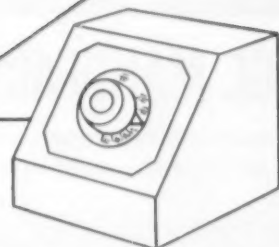
See It in Action! Booth No. 221



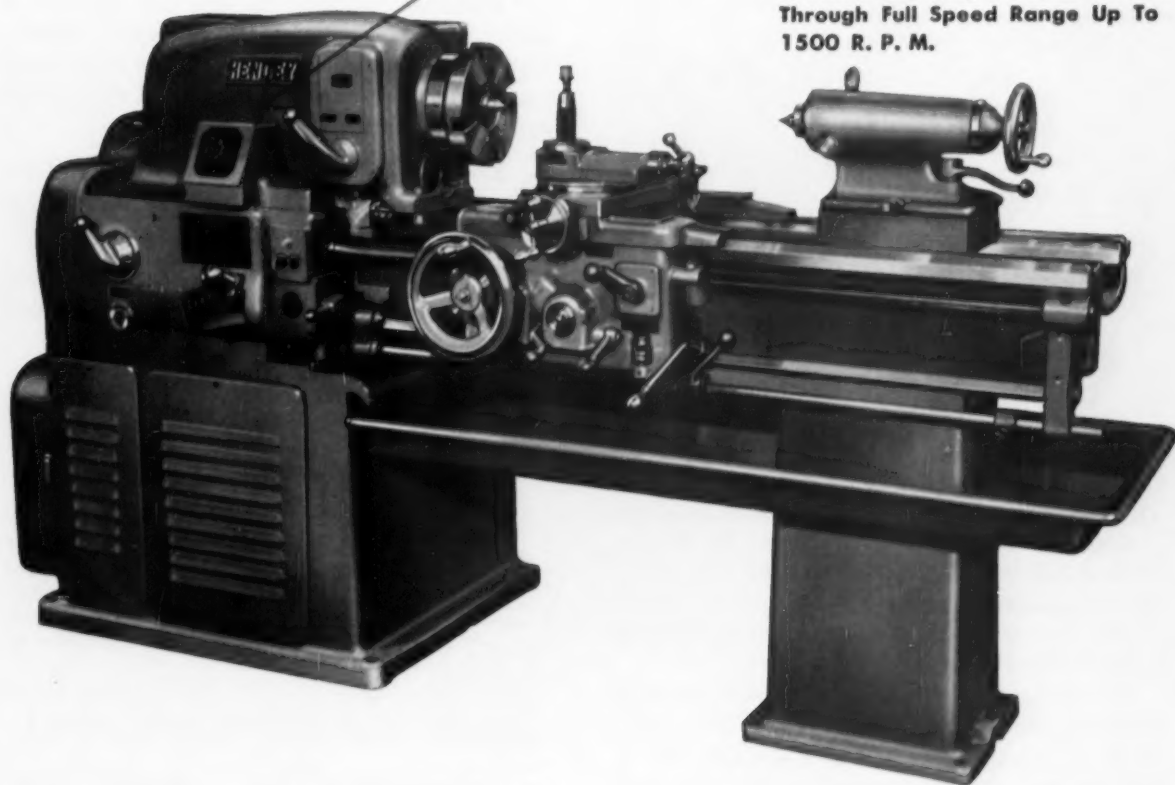
TOPS IN ACCURACY . . . HENDEY PRECISION-BUILT

SPEED SELECTOR

. cuts production time



Instantaneous Speed Selection . . .
. . . Pre-Set or While Cutting . . .
Provides Infinitely Variable Control
Through Full Speed Range Up To
1500 R. P. M.



MACHINE TOOLS

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machine division

BARBER-COLMAN COMPANY

211 LOOMIS ST., ROCKFORD, ILLINOIS



April 21, 1955

85



facts about

*Patented Tradename
of Inland Steel Company,
leaders in development
of Leaded Steels.

LEDLOY

TOOL MANUFACTURER CUTS COSTS 12% WITH LEDLOY

Ledloy combines superior machinability plus all advantages of open hearth steel



This socket head wrench is now coming off the manufacturer's production line 52% faster than it used to! Cost per part is 12% less! The difference is Ledloy.

Nothing was sacrificed to get these big savings, because Ledloy has all the fine mechanical properties of high-quality open hearth steel. How is it that a steel can combine both strength and the ultimate in free-machining properties?

The reason lies in Inland's patented process of dispersing an extremely small amount of lead—about $\frac{1}{4}$ of 1%—so uniformly through the steel that it can't be seen even when magnified 500 times. It is this uniform dispersal of lead that holds the real secret of Ledloy's amazing machinability.

In documenting actual case histories of Ledloy's performance in the shop, Inland metallurgists have found a number of reasons why these leaded steels cut production costs:

1. **Faster machining.** On many jobs, Ledloy can be machined up to 45% faster than B-1113.
2. **Longer tool life.** The fine lead particles in Ledloy lower the steel's friction component, actually lubricate the cutting tool. Also, Ledloy chips break into shorter lengths which quickly fall clear of the tool, again reducing friction.
3. **Less machine down-time.** Using Ledloy, there are fewer shut-downs for tool re-grinding. Machines work more, produce more parts per shift.
4. **Fewer rejects.** On precision parts, tolerances can be more closely controlled using Ledloy instead of conventional screw stocks.
5. **Superior finish.** The use of Ledloy may eliminate an extra step for polishing or buffing of finished parts.



If you make screw machine products or machined forgings, it will pay you to get all the facts about Inland Ledloy. Ask your cold-draw or jobber about Ledloy today. Or write Inland Steel Company for an interesting new booklet, "Properties of Inland Ledloy Steels."

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LEDLOY



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♦ Foundries and steel plants around the world have taken a look at the metallurgical blast cupola—and liked it . . . It combines the operating characteristics of the blast furnace with the low pressure blast and continuous tapping features of the conventional cupola.

♦ This combination, plus the ability to operate on a 100 pct steel scrap charge and to produce foundry iron without metal loss, has made possible improved operating efficiencies and offers important savings in costs.

Iron Age
FOUNDED 1855

**TECHNICAL
ARTICLES**

Metallurgical Blast Cupola Offers Improved Melting Efficiency

By S. T. JASWINSKI Director of Research, Central Iron and Steel Co.,
Div. Barium Steel Corp., Harrisburg, Pa.

♦ **OPERATING EFFICIENCIES** and economic advantages of the metallurgical blast cupola, in both foundries and steel plants, have rapidly gained world wide recognition for this unique hot metal producer. Thirty of these units, with capacities ranging from 24 to 480 tons daily output, have been built in the past 4 years in the United States, 11 European countries and Japan.

Largest metallurgical blast cupola is the 480-ton unit installed at Central Iron & Steel Co., Harrisburg, Pa.¹ It, and others like it, resemble a blast furnace in outward appearance. Big difference is that it retains the low pressure

blast and continuous tapping features of a conventional cupola. Design of the new cupola, based on extensive study of the blast furnace process, permits rigid control of combustion and melting while retaining the operating characteristics of the blast furnace.

One outstanding advantage of the metallurgical blast cupola is its ability to use a charge of 100 pct steel scrap for the production of hot metal of blast furnace quality. In both foundries and steel plants this permits economies in the cost of the metallic charge.

In foundries, the metallic charge is rather expensive because only about 25 pct of the

least costly ingredient, steel scrap, can be used in the conventional cupola.

Both direct and indirect economies are derived from the metallurgical blast cupola process. Continuity of operation permits maximum mechanization and helps assure a uniformly high product quality. High temperatures available are advantageous in openhearth operation and minimize foundry rejects. Refractory consumption, which averages 15 lb per ton of iron produced in the conventional cupola, averages only 0.5 lb per ton in the metallurgical blast cupola.

A detailed cost comparison for conventional and metallurgical blast cupolas is shown on

p. 91. While labor and other conversion costs are omitted, since they are governed by local conditions, the labor cost of the metallurgical blast cupola is relatively low because of the high degree of mechanization possible.

Melting operation more efficient

With the conventional cupola the bottom is dropped after each daily run. The next day the cupola is readied for operation. For continuous production from one cupola, two units operating alternately, are usually needed. The metallurgical blast cupola, which melts continuously, permits a more efficient melting operation with a single unit.

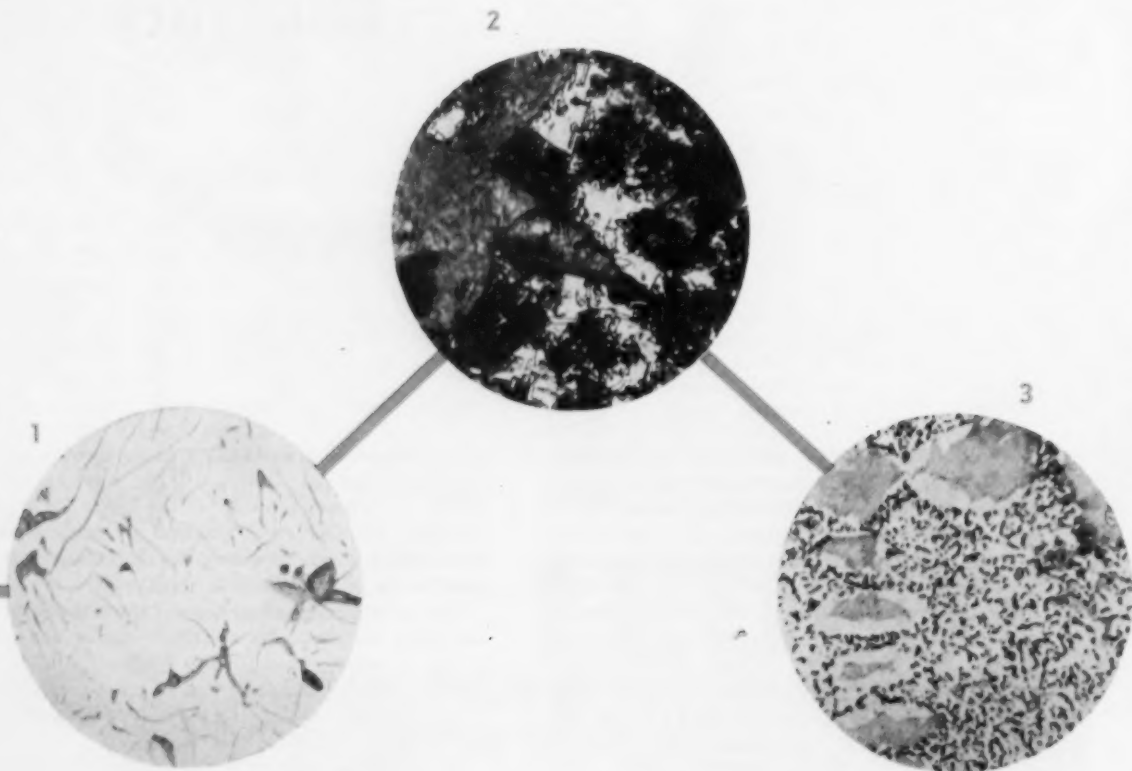
Specimens from centrifugally cast pipes made from metallurgical blast cupola iron reveal microstructure characteristic of the process. Metal analysis is 3.7 pct C, 2.8 pct Si, 0.4 pct Mn, 0.10 pct P, 0.04 pct S. An addition of 50 pct ferrosilicon was made to bring silicon to the required level.

Due to rapid cooling three metallographically different zones are evident. Graphite is occasionally in random distribution in star shaped flakes as shown at 1 and 2 below. These are thinner than in iron from a conventional cupola.

The central ring of a centrifugally cast pipe,

at 3, shows a very fine form of graphite, ferrite and pseudo eutectic mixture. The intermediate zone, in 4, shows a eutectic form of graphite with temper carbon and chilled zone with massive carbides. At 5, from the outer zone or chill section, appear massive carbides and pearlite, as well as temper graphite, a product of some cementite decomposition.

The microstructure at 4 indicates graphite crystallizes in spherulitic form in some places. Appearance of this form of graphite suggests stronger iron due to improved continuity of the metallic matrix.



Continuous tapping has a detrimental effect on the iron and cinder notches of the conventional cupola. This effect is greatly minimized in a metallurgical blast cupola through use of a carbon hearth. Carbon blocks in hearth and permanent bottom, are of blast furnace quality. They are not attacked chemically or wetted by liquid iron or slag, show excellent refractoriness under load, are abrasion resistant.

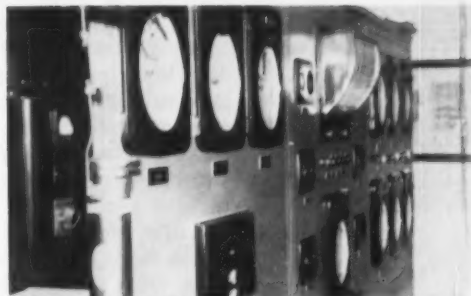
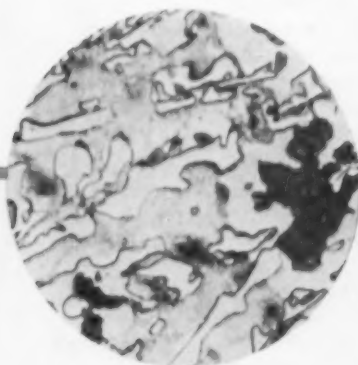
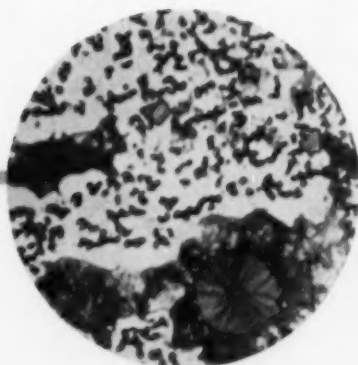
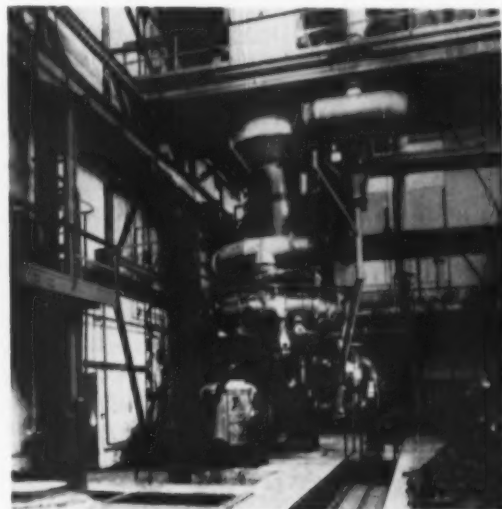
Immediately above the tuyere zone, high duty fire clay bricks are used in the melting zone. After several hours operation, this side wall lining is reduced to a thickness of 2 to 3 in. which remains constant for weeks if proper reducing conditions are maintained.

Rapid cooling stabilizes cementite forming on solidification, so that it decomposed at a temperature lower than is required to give undercooled graphite. This condition would also prevail if cerium or magnesium were added. In such cases the sulphur content must be low and the oxygen remain at a level that any further attempt at oxygen elimination is very sluggish. The analysis of the iron from the metallurgical blast cupola indicates that oxygen is very low.

METALLURGICAL blast cupola such as this one installed at a German plant resembles a blast furnace, operates on similar principles. But it uses low pressure blast, can be continuously tapped, take 100 pct steel scrap charge.

The presence of high content of iron oxide (FeO) would normally produce extremely erosive action on the lining in the melting zone. Proper control of the metallurgical blast cupola, however, maintains chemistry of the slag by limiting iron oxide content to comparable blast furnace content, approximately 0.5 pct eliminating this destructive force. Since this section is water-cooled, the lining does not become hot enough to permit reaction to occur. As a result, a balanced condition between absorption and dissipation of heat is achieved.

Since the balance of the lining exposed to the reactions is neutral, desulphurization can be carried out if certain other conditions are



Top: **FRONT TAPPING** box is used on big metallurgical blast cupola at Central Iron & Steel Co. Unit has daily capacity of 480 tons.

Bottom: **GAS AND AIR** system in Central's big unit is automatically controlled from this panel.

met. The full benefit of slag is attained when the ratio of CaO plus MgO to SiO₂ plus Al₂O₃ is higher than 1.2/1.0. The excess base in the slag is the most important factor in the transition of sulphur from metal to slag.

Low iron oxide and high temperature are fundamentally necessary for absorption of sulphur by this basic slag, while temperature and combustion govern slag fluidity and absorbing power. It is essential that constant level of metal and slag be maintained since this permits interface reaction for desulphurization.

The upper part of the refractory lining is not affected by melting, and damage can be sustained only by abrasion of unsuitable charge.

Hot metal and slag may be tapped through separate boxes or through a single slagging box. On smaller units a single box is satisfactory.

Results of metallurgical blast cupola operations further prove that drops of oxide-coated metal and oxide-bearing slag passing through the high temperature zone of CO-CO₂ and incandescent coke do have enough time for elimination of oxygen. The general law of chemical reactions applies fully because the surface area of the reaction is big in relation to weight.

Sulphur content in the tapped metal is fully controlled by slag composition, which can be computed accurately, based on knowledge of the charge and the absence of significant reaction between slag and hearth and the lining in the melting zone. Rigid control of slag does not require special foundry coke as sulphur is eliminated as in blast furnace practice.

Outer shell water cooled

Well depth of the metallurgical blast cupola is designed to provide for the reaction occurring below the tuyere zone. If the well is too shallow free oxygen from the blast or high carbon dioxide gas oxidizes slag components. If the well is too deep, excessive heat loss will lower temperature of both metal and slag.

Water cascade cooling of the outside shell prevents damage to the refractory lining and the shell itself. Above the front tapping box is a bustle pipe, insulated inside, for hot air delivery to water cooled inclined copper tuyeres protruding beyond the lining inside the metallurgical blast cupola.

Gas uptakes are located below the charging level. Exhaust gas at about 900°F leaves the metallurgical blast cupola shaft through insulated pipes leading to the gas cleaner before entering the combustion chamber of the heat exchanger. Approximately 65 pct of the gas is directed through a bleeder valve to outside atmosphere or is available for other purposes.

The remaining gas enters the combustion chamber of the metallic recuperator. This gas has a calorific value approaching blast furnace

gas, approximately 100 Btu, containing up to 29 pct CO and 1 pct H₂, is used for preheating the cold blast to about 1000 F. The closed top helps to maintain constant pressure of combustion gas in the heat exchanger.

By using hot air it is possible to easily create a high temperature zone above the tuyere level, thus contributing to the reducing condition. The ratio of tuyere opening to cupola diameter is designed to permit high velocity air to penetrate the center of the charge. Heat input from the hot blast and heat realized from combustion of carbon in the coke contribute to the high temperature of the iron which induces absorption of carbon approaching the saturation point.

Dust deposits accumulated from external gas passage are removed periodically from the tubes by a method which does not require stoppage of heat exchanger.

Total charge of coke of blast furnace quality is about 20 pct of the weight of metallic charge. This is used not only in recarburization whereby nearly 4 pct carbon enters into the solution, but also in melting and preheating the cold blast. Considering availability of exhaust gas for other uses, actual coke usage is only about 15 pct.

Absorption by molten steel in the metallurgical blast cupola of carbon to near saturation

TABLE

Analyses of Hot Metal, Slag, Exhaust Gases

Exp. No.	Steel Scrap, Pct	Limestone, Pct	Coke Ratio	Blown Air Temp., Deg F	Exhaust Gas Analysis, pct	
					CO	CO ₂
1	100	11	5:1	920		
2	100	12	4.7:1	950		
3	100	11	5:1	1000	25.5	4.5
4	100	12	5:1	950	27.0	3.2
5	100	12	5:1	950	28.0	2.5
6	100	12	4.7:1	950	26.5	3.8

Metal, Pct

Exp. No.	C	Si	Mn	S	P
1	3.69	0.30	0.25	0.047	0.075
2	3.74	0.25	0.27	0.023	0.080
3	3.61	0.18	0.30	0.045	0.070
4	3.55	0.25	0.25	0.035	0.060
5	4.30	0.30	0.23	0.030	0.076
6	4.02	0.25	0.28	0.045	0.075

Slag, Pct

Exp. No.	SiO ₂	Al ₂ O ₃	CaO	MgO	FeO	S
1	37.1	15.53	44.7	0.55	0.36	0.96
2	36.0	9.61	52.1	0.60	0.32	0.82
3						
4	34.9	11.6	50.9	0.22	0.36	
5	37.5	11.1	49.4	0.35	0.40	
6	36.4	13.0	48.0	0.50	0.39	1.18

Note: High carbon content, low sulphur and FeO content.

point is one of the major differences between the conventional cupola and the metallurgical blast cupola.

The combination of low FeO content in the slag and higher temperature of slag and metal affords reduction of sulphur without requiring desulphurization outside the metallurgical blast cupola proper. Silicon and manganese are not lost by oxidation. Also, silicon is recovered from reduction of silica and dissolved in the metal. These factors permit production of pig iron from scrap without loss in metallic weight based on charged weight, resulting in 100 pct yield.

¹Central is the sole licensee for sales of metallurgical blast cupolas in the United States, Canada and Mexico.

Note These Advantages:

1. Design permits maintenance of practically constant internal diameter in the melting zone, eliminating process disturbances and assuring regular, uniform output per time unit.
2. Absence of reactions precludes slagging of the lining, assuring constant metal characteristics. Fluxing addition controls character of slag.
3. Highly reducing conditions assure negligible FeO content, equal or lower than blast furnace, in the slag. This and higher temperature, permit desulphurization in the metallurgical blast cupola similar to the blast furnace.
4. Metallic loss, ranging from 2 to 8 pct in conventional cupola is reduced to zero in the metallurgical blast cupola.
5. Flexibility of the metallic charge required for the desired final controlled analysis makes the metallurgical blast cupola an economical unit for nonintegrated steel plants and foundries. It affords a substitute for merchant blast furnaces in certain locations and under appropriate supply and market conditions.

Applied In The Steel Plant

Low capital expenditure coupled with flexibility and economy of operation, make the metallurgical blast cupola ideal for production of hot metal in the nonintegrated steel plants. It can be banked or drained, or put into operation on a few hours notice. Metallic charge may be adjusted constantly, dependent on market prices of mixture ingredients to obtain lowest cost, while developing hot metal of desired analysis from 100 pct steel scrap.

Representative analyses of hot metal, slag and exhaust gases are shown in the Table on p. 90. Consumption of coke may appear high, but since coke is a multipurpose ingredient in metallurgical blast cupola mixture, its function must be fully analyzed to properly evaluate its cost factor.

Less costly blast furnace quality coke is used, from which nearly 4 pct carbon is dissolved in the metal, and only 35 pct of the exhaust gas is used for preheating the cold blast. The remaining 65 pct is available for other purposes. On a 400-ton per day unit, this approximates 13,824,000 cu ft equivalent to 1,244,160,000 Btu, or 8301 gallons of fuel oil with a value of about \$500 per day. Thus a credit of approximately \$1.25 per ton is derived which can be allocated to operation, mixer, drying ladles, or other functions.

Various proportions of hot metal were tried in 17 heats on 115-ton openhearth furnaces at Central Iron & Steel Co. to determine that 46 pct of hot metal added to the furnace increased the melting capacity 50 pct, from 9.6 tons per hour to 14.6 tons per hour. High carbon content and high temperature of hot metal were prime factors in these results.

Hot metal from the metallurgical blast cupola cast into pigs provide pig iron comparable to merchant blast furnace quality. This makes the metallurgical blast cupola a highly successful unit in areas having an excess of steel scrap, or under circumstances when the total cost of a charge plus \$5.00 to \$7.00 per ton conversion cost is lower than blast furnace pig iron.

TABLE

Comparison of Costs for the Same Melting Rate of Conventional and Metallurgical Blast Cupola

	Unit Cost in \$/t	FOUNDRY				STEEL PLANT			
		Conventional Cupola		Metallurgical Blast Cupola		Conventional Cupola		Metallurgical Blast Cupola	
		Pct	\$	Pct	\$	Pct	\$	Pct	\$
Pig Iron	56.00	30	16.80						
No. 1 Cupola Cast	44.50	25	11.13	25	11.13	30	13.35		
Stove Plate	38.50	10	3.85						
No. 2 Bundles	25.00							30	7.50
Machine Shop Turnings	16.50							30	4.95
No. 1 Heavy Melting	33.00	10	3.30	50	16.50	70	23.100	40	13.20
Remelt	44.50	25	11.30	25	11.30				
FeSi, 50 Pct	12c/u	0.4	0.48	2.50	3.00	1.0	1.20	0.4	0.48
Total			46.86		41.93		37.65		26.13
Cost of Loss		6	2.81	n o n e	n e	6	2.25	n o n e	n e
Desulphurizer			n o n e		n e		0.50	n o n e	n e
Coke Ratio and Cost	27.00	7:1	3.85	6:1	4.48	7:1	3.85	5:1	5.40
Refractories			0.80		0.20		0.80		0.20
Total Cost			54.32		46.61		41.20		31.73
Difference in Cost				7.71				9.47	

Silicon level for foundries on conventional and M.B.C. the same.
Silicon level for steel plant on conventional and M.B.C. the same.
Prices are Jan. 10, 1955 Cleveland area.

Compact Unit Integrates Heat Treating Operations

By W. D. LATIANO, Metallurgical Editor

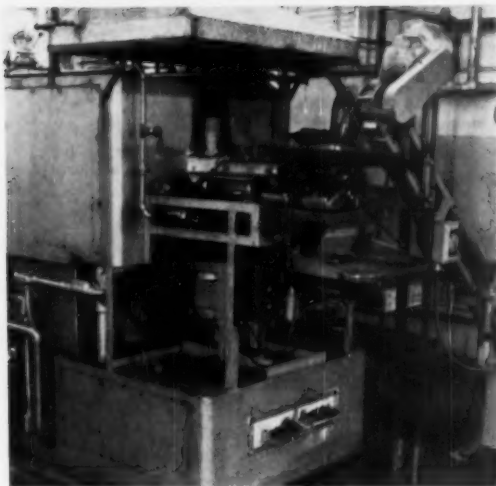
♦ Floor space is usually at a premium in a mechanized production line—particularly so when it must include heat treating facilities and space is limited . . . Both difficulties were overcome by installing a new, compact heat treating unit.

♦ Now, hardening, quenching, washing and drawing are done in a 10 by 3-ft space . . . Two different types of parts are treated side by side at a balanced production rate . . . One man handles the entire operation.

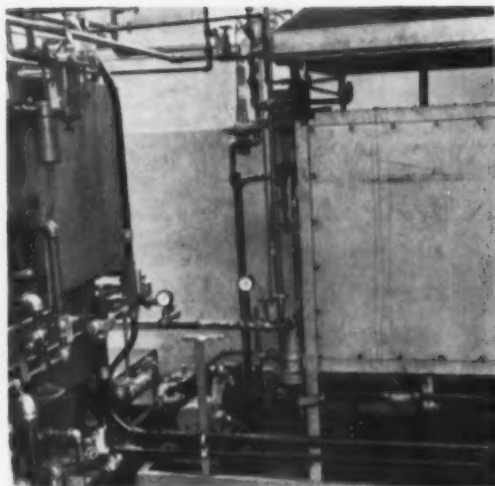
♦ CONTINUOUS FLOW production lines often require a considerable amount of floor space. This was a particular problem at the New Departure Div., General Motors Corp., Meriden, Conn., because (1) floor space was limited by the size of the building and (2) heat treating of the small ball bearing races had to be done in the production line. Both of these difficulties were overcome by installing a new type heat-treating furnace which utilizes air space instead of floor space.

The furnace was designed and built by Ferguson Equipment Corp., Pittsburgh. It not only fits into the line, but uses a minimum of floor space. In this one-unit furnace, heating for hardening, quenching, washing and drawing are accomplished in a floor space only 10 by 3 ft.

Because the line must process both inner and outer races, the same furnace must be capable of heat treating both types. The heat treating unit is equipped to do this so that production



UNIT'S compactness permits hardening, quenching, washing and drawing in small floor area.



ATMOSPHERE generator is heated electrically by Globar elements. It can use propane or city gas.

of each part is equalized and components reach the assembly state in equal quantities.

Parts are conveyed through the heat treating operations on two separate conveyor systems located side-by-side. These can operate on the same or different cycles.

In processing small precision ball bearings in this line, the inner and outer races are first machined from tube or bar stock on multiple spindle automatics. From the automatics, the separate parts are washed and then run through a chip cleaner. Outer races travel directly to the heat treating unit from the chip remover. Inner races first pass through an automatic stamping machine, then conveyed to Sintron feeders at the furnace. After heat treating, parts pass through the automatic grinding and finishing operations and eventually reach the assembly section of the line.

Parts drop into quench tank

In the heat treating operation, parts feed into two separate shuffle hearths, each having a heat-resisting muffle. Parts drop off the hearths into an oil quench tank. A mesh-belt conveyor in the tank, and equipped with separators, receives the parts in the separate sections. This conveyor then takes the parts to another conveyor of the same type where they are spray washed with an alkaline cleaner to remove quenching oil.

From the washing conveyor, the still separated parts drop onto separate shuffle hearths that take them through the drawing furnace. At the present time, installation of conveyors from the furnace to the grinding line has not been completed. Therefore, parts drop off the shuffle hearths into tote pans and taken to the grinding lines in this manner.

Inner and outer races for these bearings are made of SAE 52100 steel and heat treated to 62 to 64 RC. One man handles washing the chip remover, stamping, heat treating and testing. He also checks the furnace atmosphere and operates the atmosphere generator. The production rate is 20 lb per hour.

Control furnace temperatures

The furnace heat treating unit uses non-metallic globar heating elements in the hardening furnace. The draw furnace is heated by metallic heating elements. Hardening is accomplished at temperatures between 1570° to 1590°F and travel time through this section is 60 minutes. Maximum operating temperature is 1590°F, with the furnace operating on 45 kva, 3-phase 220-v current.

All temperatures in the hardening and draw furnaces and generator are controlled by L&N recording controllers. These, along with control circuit transformers, cycle timers and switching gear, are located on a common enclosed panel.

Indicator checks dewpoints

A protective atmosphere generator supplies 250 cfm of endothermic atmosphere to the hardening furnace. The generator is also heated by globar elements and operates at 1850°F. Propane gas is used in making the atmosphere, but city gas can also be used.

An Alnor dewpoint indicator is used to check dew points of the atmosphere at the generator and the furnace. Dew points are checked each hour after the furnace is put into operation and until the atmosphere is stabilized at the required level for the operation.

Up-to-Date Tool and Gage Records Help Production Planning

♦ Mass-produced parts in varying shapes and sizes often require a multitude of tools and gages . . . Keeping these production aids in ample and available supply takes efficient record keeping.

♦ Timken Roller Bearing Co. keeps track of more than a half-million tools and gages with colored-card files . . . System avoids wasteful tool and gage duplication and helps achieve low-cost production.

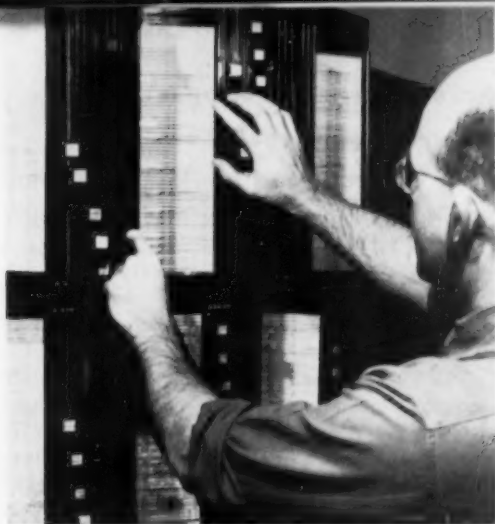


Above: MACHINE operators fill out simple request slips when they need tools, gages or machine parts.

Left: ALL tools and gages are etched with permanent serial numbers for the inventory-control file.



By M. C. CURTIS
General Foreman
Tool Inspection Dept.
Timken Roller Bearing Co.
Canton, Ohio



WALL bracket files in tool cribs give attendants a quick, accurate check on all items.

◆ **TO KEEP TABS** on more than a half-million expensive tools, gages and machine parts, Timken Roller Bearing Co. uses an efficient, economical and up-to-date record-keeping system. Major benefits include more economical and faster bearing production; elimination of unnecessary duplication in tools and gages; and assurance that these production aids are available when and where they are needed.

Actually, the company uses two record systems; one for production tools, gages, etc., and another for maintaining complete data on all master gages.

Records for production tools and gages are kept up to date in both a General and a Central card file. The General file is maintained primarily to assist tool and gage crib personnel. The Central file summarizes General file information to help Production Department planning.

The General file uses blue, salmon, yellow and green colored cards. Each blue card records monthly production volume of a bearing component which requires the use of a particular gage. These cards help the crib supervisor to determine the number of tools and gages to have on hand for producing a particular bearing part.

The salmon, or group card records the quantity of identical tools, gages or machine parts currently in use to produce a given bearing part. It also lists these tool and gage locations, their blueprint numbers and whether an order has been entered for additional items.

The yellow card carries the individual record of each particular gage, tool or machine part, indicating when the item was first placed in service, and how often it has been reconditioned or inspected. The green card is an inventory report which indicates the number of spares for a particular sized gage or tool.

To assure speedy location of a tool or

gage in the tool crib, wall bracket files are conveniently placed in each crib. These files duplicate the information in the production tool and gage Central files.

Entries in the General file are made in the following manner. When a new machine part, tool or gage is taken from inventory (and the fact noted on the green inventory card) the crib attendant assigns a serial number to the piece. This serial number is etched on the gage and recorded on a tool crib record slip.

Issue date, tool crib number, serial number, description of the item and the reason for placing it in service are also recorded on the tool record slip which is then sent to the General files. There a file clerk fills out the history (yellow) card to show when the piece went into service. If it is required for increased production, it is added to the group (salmon) card list. If the new item simply replaces a worn-out piece in the group, this group card remains unchanged.

The responsibility for receiving new pieces in the tool crib rests solely with the tool crib supervisor. Responsibility for recording data in the General file rests with two tool crib file clerks.

The Central files summarize all the information in the colored-card General file. They accurately record all gages, machine parts and tools immediately available to produce a particular bearing part, and also show the type of machine for which any bearing part is currently tooled.

Aids production planning

Value of the Central file is that it promptly reveals to the Production Department the quantity and type of tools and gages available to produce a particular bearing part. Thus the time required to complete an order for this part can be quickly and easily calculated. The Central file also makes it possible to utilize shop equipment more efficiently for fast, economical production.

Benefits from the new production tool and gage control system are many. Crib supervisors avoid unnecessary duplication by ordering fewer tools and gages to be made up in the tool room. Most important, tools and gages are now located where they are needed, and available when they are needed.

The record system also insures that tools and gages used on bearing parts in slight demand do not have to be checked for accuracy so frequently. On the other hand, tools and gages for parts in great demand are checked frequently and regularly.

Before the new card records were installed the tool room would often receive rush orders for new tooling. This caused other urgent work to be sidetracked and delayed while skilled machinists were often paid overtime rates to get out these rush orders. The new

"The company's record-control systems make no serious demands on shop employees . . . Machine operators simply fill out requisitions which serve as receipts when tools or gages are returned . . ."

system has greatly minimized this condition.

Also when there is a change in bearing part dimensions, all gages and tools for that particular part must be called in. Either new tools and gages are issued, or the old gages changed to match the new dimensions. With the former system, if all the old gages were not called in, it was possible that some of them might be used on the new bearing part, thus creating needless waste. Now in such cases, the new filing methods show at a glance whether all the old gages have been returned.

Helps predict demand

At Timken, the crib supervisor is responsible for tool and gage distribution and maintenance of sufficient inventory. Formerly, because of this responsibility, the supervisor was often reluctant to transfer tools and gages, even temporarily, to another department. He could never be sure when they might be needed in his own department.

Now, with his accurate record of tool and gage use during the previous year, the supervisor can fairly well predict future demand for these items. He is quite willing to transfer to another company plant the tools and gages which apparently will not be used by his own plant. This makes for greater production flexibility at lower cost.

An equally important factor in the company's overall control program is the master gage

filing system, which has been established for almost 30 years. These master gages are the reference standards for checking all production tools, gages and machine parts.

The file record for each master gage describes the item and lists special dimensions that do not appear on the gage blueprint. It also notes the condition of the gage when last inspected, the inspector's name, present location of the item and its specified inspection and reconditioning cycle for it. Responsibility for the accuracy and condition of this master file centers on five highly trained tool and gage inspectors.

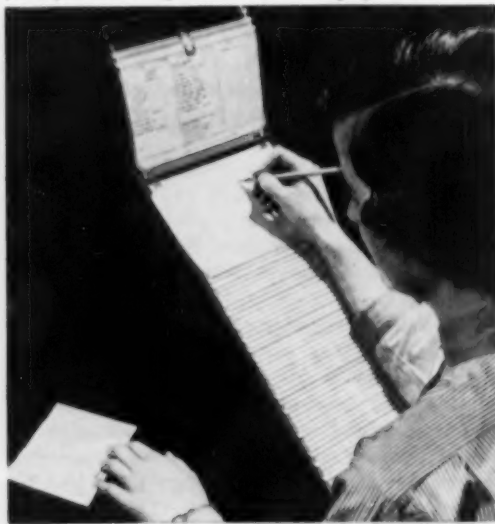
The company's record-control systems make no serious demands on shop employees. Whenever a machine operator requests a new production or master gage, a tool, or a machine part, he simply fills out a white requisition slip. He indicates thereon the bearing part number for which the item is to be used, a description of the item issued, the machine number on which it will be used, also his time clock number and his signature.

The crib attendant completes the requisition slip by adding the serial number of the part issued and his own signature. The slip is placed in the bin from which the tool or gage was removed and remains there until it is returned. The slip is given back to the operator as his receipt when he returns the tool or gage.

CRIB supervisor receives new tools and gages, is responsible for distribution and inventory.



SYSTEM uses compact card files, depends on prompt recording of all tool and gage data.



Many types available—

Mass Production Methods

Spur Industrial Use

of Refractory Ceramic Coatings

- ◆ Industry is benefiting from military experience with refractory ceramic coatings on metals . . . New formulas, lower cost techniques make coatings worth a look when service temperatures exceed 1200°F.
- ◆ Modern coatings allow substitution of lighter gage metals, sometimes permit mild steels to replace higher alloy grades . . . Coatings extend service temperature limits of any steel grade, can even be machined after they're applied

By F. D. SHAW, Vice President, The Bettinger Corp., Waltham, Mass.

◆ COATING STEEL with refractory ceramics for high temperature applications is a fast growing business. Mass production techniques permit applying these coatings to virtually any alloy at reasonable cost.

Ceramic coatings are applicable where service temperatures exceed 1200°F. They are not to be confused with conventional porcelain enamels.

At temperatures below 1500°F, ceramic coating will prolong the life of steel parts almost indefinitely at temperatures up to 2100°F, coated parts will outlast uncoated components anywhere from two to five times.

Coatings also permit substitution of thinner gage material or lower alloy grades to save weight or conserve ingredients in short supply. In many instances, a coated mild steel can be substituted for an uncoated higher alloy grade such as stainless.

As still another advantage, a ceramic formula can usually be developed to raise the service temperature limit of a given alloy. Coated low alloy steels are being used at temperatures 400 to 500°F higher than would be practical for uncoated grades.

These coatings do not affect the original structure properties of the base metal. They also machine readily. In production, many jet parts are machined after coating.

Literally hundreds of ceramic coatings have already been developed and new ones are constantly being formulated. Some, developed by Bettinger Corp., Waltham, Mass., for small jet engine parts, have withstood flash heating for 5 minutes at temperatures above 2800°F.

As a typical example of modern ceramic performance, consider the following laboratory tests run on coated strips of 321 stainless:

- (1) Strips withstood 10 immersions from

SPRAY - COATING the combustion chamber of an industrial furnace with a refractory ceramic. Coating enables the part to withstand higher furnace temperatures and extends service life.



1600°F to water at room temperature, plus another five immersions from 1700°F to water at room temperature without signs of failure.

(2) Impact of a 3 lb weight dropped five times from a height of 40 in. caused no visible damage to the coating, although the base metal was distorted.

(3) In an oxidation absorption test strips were heated more than 200 hours at 1700°F without adverse results.

(4) On a 90° angle cold bend test only slight powdering of the ceramic occurred.

Hot spot resistance of coated parts is also outstanding. One test calls for 10 cycles of torch flame heating to 1700°F, followed by immersion in water. In another test the part is heated in a blast of hot gas, then air cooled for 15 minutes. This cycle is constantly repeated for 16 hours.

Resist many gases

In sum, the ceramic coatings presently available afford excellent heat and thermal shock resistance despite metal distortion. Most metals will distort if heated to 1500°F and quenched in cold water.

High temperature coatings not only take these shocks, but also protect the base metal against carbon absorption, attack by lead-bromide vapors and inter-granular corrosion. They will also resist vanadium gases, chlorine, carbon dioxide and sulphur dioxide. As still another advantage, ceramic coatings have high abrasion resistance.

Choosing the proper ceramic for coating parts received at the Bettinger plant involves many variables. The shape of the piece is obviously important. Other considerations are (1) metal composition and structures; (2) gage of the material; (3) whether the part is cast, welded or both; (4) intended end use.

For example, to be successful, coatings on low carbon steels must be fused early in the heating cycle to prevent excessive oxidation. Conversely, for highly alloyed metals fusion must be delayed until sufficient oxidation assures proper adhesion of the coating.

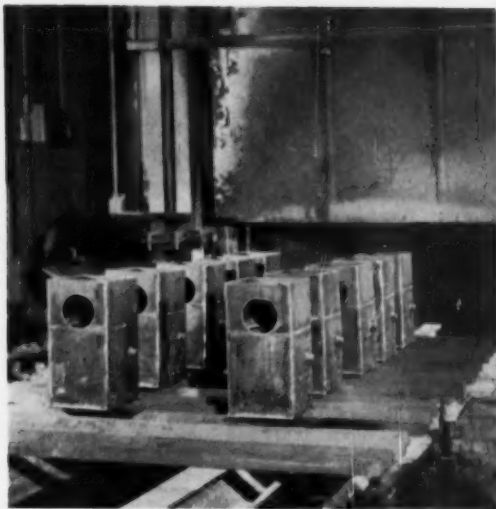
Metal is key factor

As already stated, base metal structural properties are key factors in coating selection. Because the coating is mainly intended to protect against heat and corrosion it adds little structural strength to the part. The base metal's strength, age hardenability and creep rate will all affect coating performance in actual service.

The Bettinger plant finds that an even coating thickness ranging from 0.001 to 0.0015 in. affords best results. Less than 0.001 in. does not afford complete protection, while a coating thicker than 0.0015 in. spalls more readily in thermal shock tests.

This thickness range also provides optimum matching of the coefficient of thermal expansion between the coating and the base metal. This is a guarantee of high resistance to thermal shock.

Manufacture of a coated part at the Bet-



PARTS to be ceramic-coated enter an annealing furnace as the first step in the process.

tinger plant calls for close control and careful handling in annealing, scaling, pickling, burning-off, sandblasting, slip application, firing and inspection. Spot inspections during production are necessary to check on the coating and determine its thermal and mechanical shock resistance.

When parts are received for coating they are annealed to relieve internal stresses and bring out surface scale. A series of acid and rinse treatments then removes this scale and etches the surface. After masking all machined and threaded portions of the piece, sandblasting with 45 mesh flint shot at 40 psi removes final scale and further etches the surface.

Sandblasting not enough

Tests run in Bettinger's laboratory indicated that sandblasting, alone, does not adequately prepare the base metal for coating. Results showed that the pickling and rinse cycles are equivalent to two firings and a sandblasting. These careful preparations of the base metal avoid the possibility of excessive rejects, and are more economical in the long run.

The coating itself is prepared in small batches. As a rule it cannot be stored more than a week without breaking down and losing its "set." However, the Bureau of Standards' A-418 formula prepared according to standard milling practice works well up to two weeks.

The ceramic slip must be constantly checked for specific gravity, viscosity, fineness, temperature, pickup and water content. Drying speed also affects the final results. Slow drying causes the coating to double-drain; fast drying causes water marks.

Coatings are applied by dripping, slushing or



HOT acid bath removes scale and etches parts before high temperature ceramic is applied.

spraying. Odd shapes are sprayed at low pressure with special nozzles. The spray method gives a smoother finish and eliminates drain marks. Heavy drain marks sometimes cause a coating to spall or flake from the metal.

Dipping is quickest

Dipping is the fastest and least expensive coating technique, while slushing is used to coat otherwise inaccessible inside surfaces. Although dipping is easiest to control and uses less material, the slip must be continuously agitated and maintained at a constant temperature or the coating will watermark.

Firing is done in an oil-fired, muffled furnace box at 1875 to 1900°F for about 35 minutes. After firing, visual inspection is made with special illuminating fixtures and stands to show up spally or uncovered sections. Unsatisfactory parts can be reworked, but only once.

The experience gained in coating parts for the military is now being made available to the civilian market. Bettinger Corp. has recently coated aircraft engine nozzle boxes, flame holders, flame mufflers, oil refinery tubing, part trays used in heat treating, nichrome elements and collector rings. Another practical application doubled the life of annealing furnace tools that formerly needed replacement every 30 days.

Trial coatings on turbine blades show excellent promise for the future. Other possible applications in this field are the exhaust systems of guided missile engines.

Recent improvements in coating methods include (1) a means of aspirating excess coating, (2) development of better dipping and spraying equipment, (3) better methods of handling, and (4) more efficient cleaning equipment.

Cast High Strength Irons To Standard Stock Sizes and Shapes



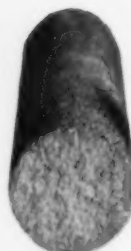
QUALITY check on cast bar stock includes ultrasonic inspection by the contact method.

By OLIVER SMALLEY,
President,
Meehanite Metal Corp.,
New Rochelle, N. Y.

♦ High strength cast irons, produced in standard sizes and shapes and stocked at the foundry, offer the materials engineer high physical properties required for many parts at low cost.

♦ Careful foundry practice is a must in producing uniformly clean, solid bars, bushings and other shapes . . . X-ray, ultrasonic and other inspection methods help assure consistently high quality.

CAST bars of type GA Meehanite from left to right are 1.2 in., 2 in. and 3 in. in diam. Despite size differences they show similar microstructures, have 50,000 psi tensile strength.



♦ **MANY STANDARD METAL** shapes used in the machine tool, aircraft, automotive, tool and die and other industries can be cast to exacting physical property requirements without causing the customer the time and expense of having patterns made.

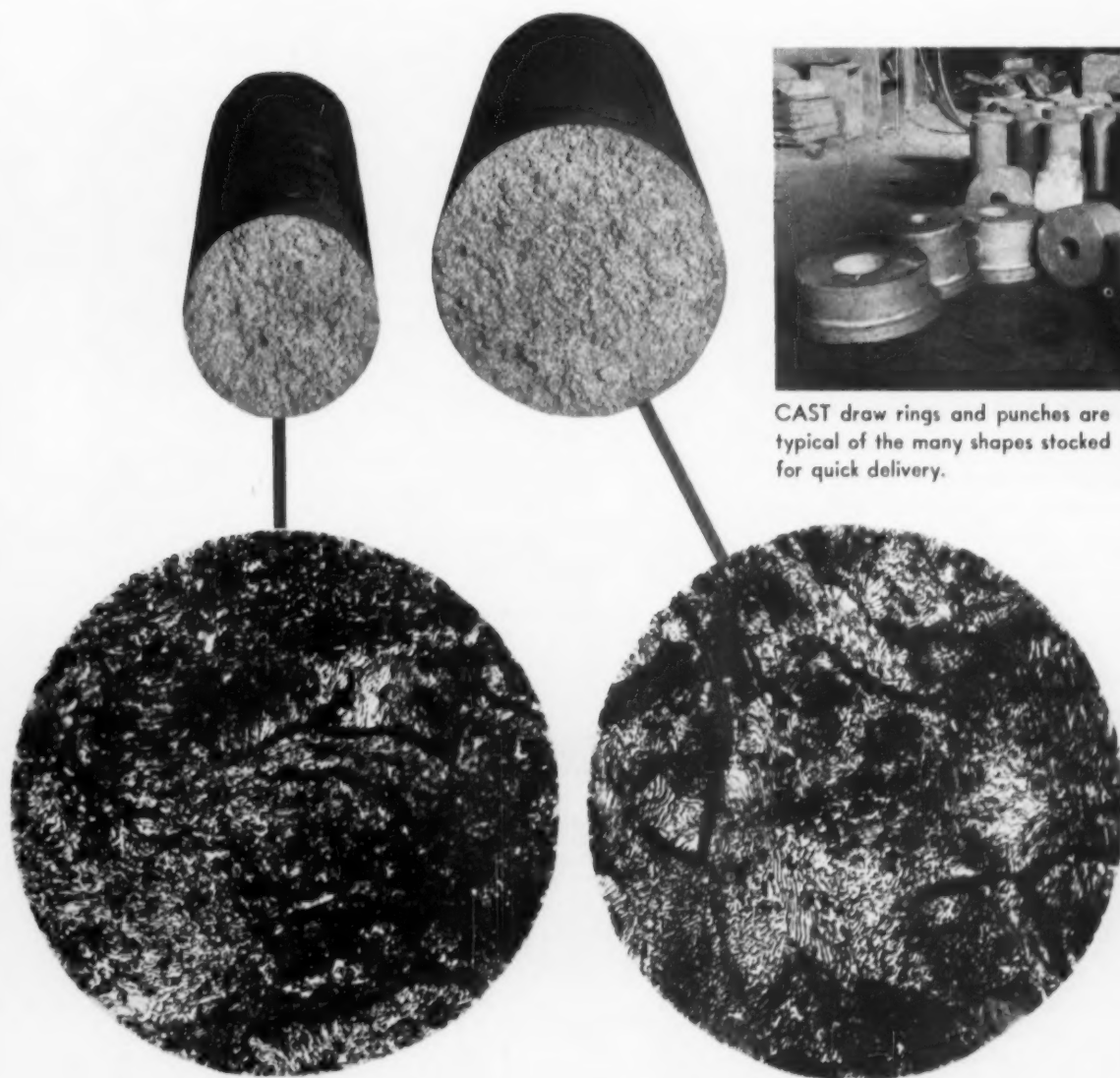
It is common to associate standard shapes, such as bar and bushing stock, with rolled and forged materials. Although cast bar and bushing stock is more unique, use of these products is increasing. Foundries manufacturing Meehanite metal specialize in offering these and other cast forms in a wide range of engineering properties.

Properties of the 26 available alloy types include wear and corrosion resistance, resistance to galling and seizing, ability to dampen vibration, dimensional stability, hardenability and improved machinability. Bar stock cast

from sound and dependable material also offers flexibility in delivery of odd shapes and sizes to exacting specifications.

From the foundry viewpoint, it would seem that bar and bushing stock would be about the simplest types of castings to make, either by conventional or centrifugal methods. But casting a uniform defect-free length of stock to a bar, cylindrical or any other shape, with specified properties is anything but simple. Precise foundry practice, and the positive control of metal specification, molding and gating procedure present problems both to the experienced and inexperienced.

In the first place, most cast materials with controlled elastic and strength properties shrink excessively in passing from the molten to the solid state. Center line shrinkage voids and fissures are common defects



CAST draw rings and punches are typical of the many shapes stocked for quick delivery.

in long lengths and varying sizes. Mass influence is another difficulty: gray iron cast thin enough becomes white; white iron cast heavy enough becomes gray.

Control of the delicate carbon-silicon balance to produce a uniformly solid casting, with high strength properties and machinability, is a vital consideration. The final combination of physical properties depends on the relationship between the melt's constitutional carbide value, the recarburization value of the furnace charge and final graphitization as related to sectional dimension of the bar stock.

This is illustrated in an accompanying photograph which shows the fractures of three different sized stock bars made from type GA metal, with specified 50,000 psi tensile strength. Each bar has the same chemistry, but through control of the carbide values similar microstructures and strength properties are obtained despite the size differences.

Set inspection standards

Rigid inspection standards must also be established for these cast products. Three basic inspection methods are recommended to insure highly uniform quality. These include: (1) sectioning (from top and bottom of the bar) to determine openness of grain or other defects; (2) X-ray examination of a portion of each casting lot; (3) ultrasonic testing a reasonable portion of bars from each lot.

In the ultrasonic test method, high frequency sound waves are passed through the material. Sound reflections other than those produced from the opposite surface of the bar are noted on an oscilloscope.

Recent studies by Meehanite Metal Corp. and Sperry Products Co., Danbury, Conn., manufacturers of the Reflectoscope, have determined the smallest size flaw that may be found using this testing method. Maximum distances that may be penetrated when using a given frequency with different types of

Meehanite metal, have also been determined. The Reflectoscope marker may be adjusted to determine the exact distance a noticeable defect may be from the testing surface.

Use of a water bath eliminates the need for a machined or ground surface for contact between the quartz crystal used for transmitting the sound waves and the bar to be tested.

To obtain a suitable surface for testing by the control method, bar stock usually has a portion removed by sawing. Slag, cracks, dirt, porosity, shrinkage, gas and blowholes, and change in the size and amount of graphite flakes may be detected ultrasonically.

Minimum size defects that may be found in different types of Meehanite metal at different frequencies are listed in the accompanying table, together with the maximum distance that can be penetrated. By changing the frequency to 1 mc the penetration distance can be increased although this will also increase the minimum size of a detectable defect.

Products currently made from cast bar and bushing stock include: Gages, gears, cams, pistons, pinions, plugs, chucks, dies, plastic molds, hydraulic mechanisms, diesel fuel injectors, aviation brake segments, etc.

One interesting product machined from Meehanite bar stock is a model aircraft engine. Such engines are designed for lightness, strength and good wearing properties.

Cast standard shapes are especially advantageous for the die, tool and fixture industry. Draw rings, punches and die components in a variety of forms are available without requiring the buyer to order special pattern equipment. This not only means a saving, but such castings can frequently be shipped within one week from receipt of order.

Other cast products that can be produced to standard shapes for these customers are tool making fixtures and components such as surface, angle and lapping plates, box and flat parallels and universal right angles.

TYPICAL parts machined from bar stock cast to desirable physical property combinations.



Defect Size vs. Frequency

Type Meehanite Metal	Frequency, mc	Minimum Size Defect, in.	Maximum Distances, in.
GA	2.25	3/32	30
GB	2.25	3/16	24
GC	2.25	3/16	18
GD	2.25	3/16	12
GE	2.25	3/16	6
GA	1.0		66
GB	1.0		63
GC	1.0		60
GD	1.0		45
GE	1.0		30

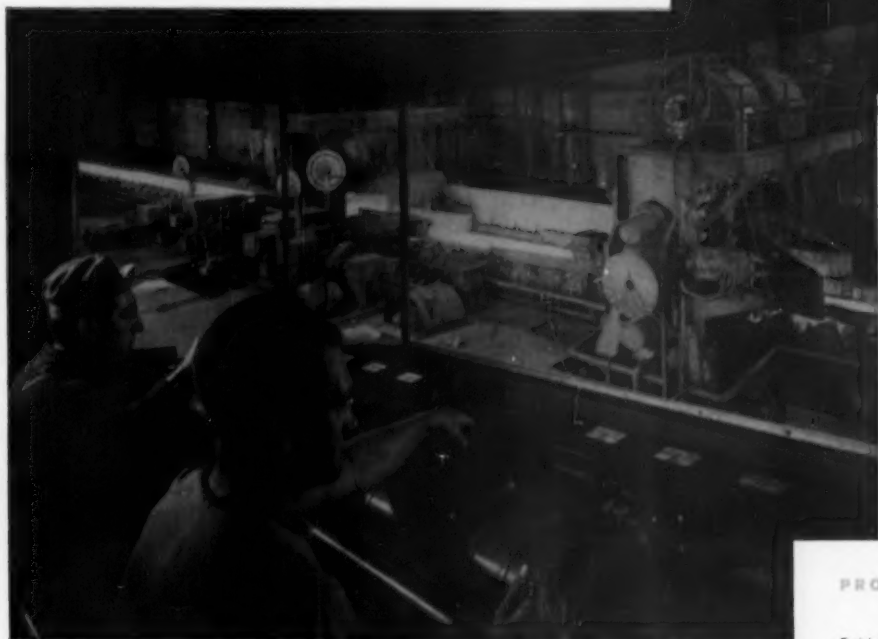
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- Hot-Rolled Pickled Steel in Coil
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- Hot-Rolled Pickled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorband Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Electric Weld Line Pipe
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

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New Technical Literature:

Catalogs and Bulletins

Steel forgings

A bulletin describing briefly but completely the operation of a steel forging business integrated from electric steel making to finished machining is available. Topics briefly covered include: open die forging, heat treating, rough machining, flame hardening, nitriding, finish machining, contract work, and quality control. *National Forge and Ordnance Co.*

For free copy circle No. 1 on postcard, p. 109.

Foundry cleanliness

Immediate steps that can be taken towards achieving the foundry industry's goals of better, safer and

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Money-saving products and services are described in the literature briefed here.

For your copy just circle the number on the free postcard, page 109.

cleaner working conditions for employees are described. The bulletin tells how some recently developed products can help hold foundry dust to a minimum. *Fred-eric B. Stevens, Inc.*

For free copy circle No. 2 on postcard, p. 109.

Treating concrete

The manufacturers of soluble silicates have available a folder covering the subject of treating concrete. The sodium silicate's function of penetrating concrete surfaces to setup hard "gel formations" within cell pores is given for the product's efficiency in hardening the concrete. This dust-proofs the surface and makes the concrete resistant to oil, water and acids. The silicate is diluted with water for easy application and initial low cost. *Philadelphia Quartz Co.*

For free copy circle No. 3 on postcard, p. 109.

Power cylinders

Over 7500 different cylinder selections are now carried in stock for immediate shipment to meet the rush needs of power cylinder users, by Miller Fluid Power Co. All stock cylinders are of standard Miller design and construction, with solid steel bar stock heads, caps, and mountings, hard chrome plated piston rods, dirt wiper seals, precision-honed tubing, tamper-proof, wear-compensating seals and other features. *Miller Fluid Power Co.*

For free copy circle No. 4 on postcard, p. 109.

Mechanized furnaces

Mechanized furnaces which can increase production rates without a proportionate increase in required floor space are illustrated and described. Production rejects can be reduced because of better uniformity of heating and closer control of metallurgical cycles. Mechanization can be achieved with two basic types of standard rated furnace arrangements, described in the folder. *Surface Combustion Corp.*

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You'll be surprised how Hendrick Perforated Ornametal fabricated into products can add a magic touch to sales . . . Today, more and more designers keep a copy of Hendrick's Ornametal catalog close to their drawing board. The reason is plain—Hendrick Ornametal dresses up and adds sales appeal to product appearance. Whatever your needs be if you design or sell radiator enclosures, stoves, lockers, furniture or any appliance, you can rest assured there's a Hendrick Ornametal design suited to your needs. For more complete details on how Hendrick can help your profit picture, call your nearby Hendrick representative today.

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tectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

FREE TECHNICAL LITERATURE

Conveyors

A new 4-page bulletin tells how a company uncorked production bottlenecks in its stamping department with the A-F live rail conveyor system. Problems and their cure are described, and photographs and diagrams are included, showing how handling damage can be eliminated. *The Alvey-Ferguson Co.*

For free copy circle No. 6 on postcard, p. 109.

Lubrication

A booklet which describes in detail lubrication of steel mill equipment has been published. The information presented is designed to supply the operator of United steel mill equipment with a comprehensive outline of the lubrication needs which will be met in the daily operation of his machines. Topics covered include: circulation systems, bath splash systems, centralized lubricating systems, mechanical force feed systems, and mist or atomized oil systems, and lubricant recommendations. *United Engineering and Foundry Co.*

For free copy circle No. 7 on postcard, p. 109.

Standard colors

Fast and accurate instrument readability with minimum operator fatigue are the aims of the latest standard color combinations announced in this bulletin. The results of color instrumentation study are offered in true color reproductions. *Bailey Meter Co.*

For free copy circle No. 8 on postcard, p. 109.

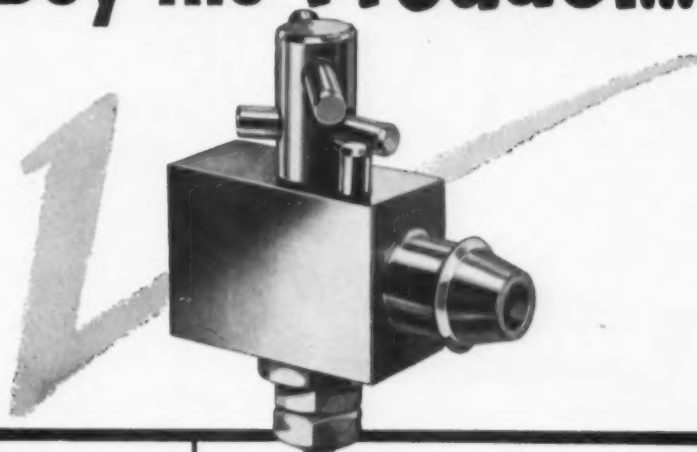
Industrial trucks

A condensed catalog illustrating and describing a line of power industrial trucks has been issued. Included are sections on ELPAR fork trucks, high and low-life platform trucks and crane trucks. The catalog also contains data on many of the company's specially designed vehicles for specific operating requirements. Another section contains pictures and data on more than a dozen attachments designed to increase flexibility of the industrial trucks. *The Elwell-Parker Electric Co.*

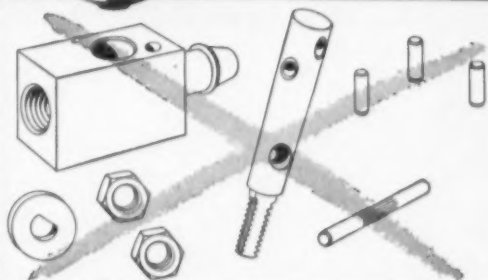
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FREE TECHNICAL LITERATURE

Tungsten wire

Platinum clad tungsten grid wire, which is used for higher frequency, higher power and elevated temperature applications, is described and illustrated in a new folder. It is readily cold or hot stretched to take a permanent setting and lends itself to fabrication into grids employing conventional fixtures and spot welding procedures. It can be obtained over a broad range of diameters. *Baker & Co., Inc.*

For free copy circle No. 10 on postcard, p. 109.

Diesel engines

A 20-page bulletin describes the features of type S and SS heavy duty diesel engines in sizes from 375 to 1000 hp. It provides complete information about the lubrication, cooling and fuel injection systems of the engines, and furnishes details about engine housing design, full floating aluminum bearings, gear driven auxiliaries and other features. *Ingersoll-Rand.*

For free copy circle No. 11 on postcard, p. 109.

Direct flow pump

The design, operation and advantages of a 2½-in. stroke direct flow pump is described in a new bulletin. Photographs and line drawings illustrate pump construction and operation. The "Powr-Pac," smallest of the Aldrich line of direct flow pumps, is designed for installations which heretofore were forced to use larger pumps than were actually needed. *Aldrich Pump Co.*

For free copy circle No. 12 on postcard, p. 109.

Forging hammers

A 20-page catalog describes the Electro-pneumatic forging hammer which is completely self-contained, and does not require compressors, boiler, piping, or fuel. Just the "touch of a button" and it is ready to operate, and a press of the foot-treadle for the lightest to heaviest ram blow. For every requirement, the various types are illustrated, along with examples of specific applications. *Lobdell United Div., United Engineering and Foundry Co.*

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THE BROOKS

LOAD LUGGER



picks up



hauls



dumps



puts down

WHAT IT IS

The **BROOKS LOAD LUGGER** is a flat-bed truck body with a pair of hydraulic-powered hoisting arms, which is mounted on any truck chassis of suitable capacity. Standard models lift pay loads of up to 18,000 pounds at a time. Some special-purpose models lift much heavier pay loads.

LOAD LUGGER CONTAINERS are patented, tilt-dumping containers with deep, leak-proof bottoms. Capacities range from 1½ to 14 cubic yards for standard models. Some special-purpose models are much larger. A variety of open and closed containers handle solid materials, powders, sludge, liquids, and gases. Special pallets handle free-standing and unit-packaged materials.

Controlled by the driver from his cab, the truck-mounted Brooks Load Luger lifts a Load Luger Container onto its steel deck, carries it well forward for correct load distribution, cradles it between steel sidewalls for travel safety, hauls it away, dumps or spreads its contents, then returns the container and puts it down.

HOW IT IS USED

The **LOAD LUGGER SYSTEM** of materials handling calls for a number of Load Luger Containers to be placed at points of need. These containers collect material as it accumulates, which reduces handling and eliminates loading crews. Then, loaded containers are picked up, hauled away, dumped, and returned on a regular schedule by a truck-mounted Brooks Load Luger, which replaces many conventional trucks and eliminates loading time formerly required.

WHO USES IT

Industrial operations all over the country (quarries, foundries, steel mills, paper mills, refineries, chemical plants, brick plants, metal fabricators, etc.) use this versatile equipment to handle raw materials, finished products, and waste materials. Contract haulers of wet and dry refuse prefer Load Luger equipment, as do scrap metal dealers, construction contractors, cemetery operators, and sugar cane growers. Government approval is evidenced by the many municipal, state, and federal installations. New uses and new users, such as cable reel handling by power and telephone companies, are constantly coming into the picture.

WHY THEY LIKE IT

The Brooks Load Luger has no cumbersome superstructure or extra operating gadgets because of its patented simplicity, clean design, and sturdy construction. This results in a lower first cost, lower maintenance costs, the ability to carry more pay load on a given truck chassis, and a clear deck for multipurpose use. Its double-acting hydraulic cylinders, four-point container suspension, secure container cradling, and fully controlled tilt dumping are important contributions toward greater operational safety.

Load Luger Containers are job-designed and job-proved. They are low and easy to load to full rated capacity. They dump clean because they are tilt-dumping, and they have no bottom openings to allow messy or insanitary leakage. Appropriate models are dust-proof, rat-proof, fly-proof, and almost odor-proof.

Load cells, beams

Baldwin Sr-4 load cells and load beams for electrical measurement of weight and force are presented in a 20-page bulletin. Principles of measurement, specifications of load sensitive devices, available instrumentation, and typical applications are included in this interesting bulletin. *Baldwin-Lima-Hamilton Corp.*

For free copy circle No. 14 on postcard, p. 109.

Testing machines

An 8-page guide to the selection of testing machines has just been published. A ready reference for the testing man's library, the guide indicates the broad range of machines, instruments and accessories available from one source. Two entirely new units are described. *Riehle Testing Machines Div., American Machine and Metals, Inc.*

For free copy circle No. 15 on postcard, p. 109.

Horizontal boring

A new catalog on horizontal boring, drilling and milling machines lists specifications and construction illustrations of 4-inch spindle diameter machines. In addition to specifications on their standard line of mills a portion of the catalog is devoted to special attachments and controls. *The Portage Machine Co.*

For free copy circle No. 16 on postcard, p. 109.

Spectromet

Bulletin No. 42 discusses a small direct reading instrument for quality control directly on the foundry floor. Spectromet will accommodate a work load involving six elements in one matrix. New features are a sealed optical system, dust tight electronics and an automatic mechanism for maintaining optical alignment. *Baird Associates, Inc.*

For free copy circle No. 17 on postcard, p. 109.

Small parts

An 8-page catalog covers all products in the NesTier line of small parts handling equipment. Amply illustrated with installation photographs, the brochure also shows how an integrated, plant-wide parts handling system can be custom tailored to individual requirements using standard stocked NesTier units. *The Chas. Wm. Doepke Mfg. Co., Inc.*

For free copy circle No. 18 on postcard, p. 109.

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FREE TECHNICAL LITERATURE

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This section starts on page 104

Separate motor reducer

A bulletin on the versatile Sterling slo-speed separate motor reducer has just been published. These motor reducers meet established machine or equipment standards for separate motor-reducer combinations, and provide the required versatility for economically adjusting either horsepower or speeds to meet changing production needs. *Sterling Electric Motors*.

For free copy circle No. 19 on postcard, p. 109.

Steel shop equipment

An illustrated booklet describes steel shop equipment. Items include: smooth top benches, pressed bench legs, bench drawers, all steel work stands, all steel machine stands, tote boxes and welding benches, and bench parts and accessories. If needed, variations of cataloged items or special types of benching are made. *Industrial Bench and Equipment Mfg. Co.*

For free copy circle No. 20 on postcard, p. 109.

Ramming mixes

Comprehensive information on the use of Permanente 165 and 84 ramming mixes for open hearth and electric steel furnaces is presented in a new 38-page booklet. The publication gives detailed instructions for building forms, mixing the basic refractory materials and ramming them. Recommended heat-up schedules and material estimating charts are provided. Drawings and installation photographs facilitate use of the booklet. *Kaiser Chemicals Div., Kaiser Aluminum & Chemical Sales, Inc.*

For free copy circle No. 21 on postcard, p. 109.

Quantograph

An interesting folder on the Quantograph, which is three precision analytical instruments in 1 (spectograph, quantometer and monochromator) is available. To date, separate instruments have been required for the various procedures that can now be done with this single instrument, which embodies design principles known to give the maximum accuracy, precision and stability. *Applied Research Laboratories*.

For free copy circle No. 23 on postcard, p. 109.

Gas regulators

The regulators described in this catalog have a mechanical assembly of the nozzle, seat, spring, guide and filter incorporated as one unit, which allows the vital internal parts to be completely changed in less than two minutes' time. They also have the exclusive use and design of a practical guard to protect the fragile gauges, providing safety with minimum maintenance costs. *Oxo Welding Equipment Co.*

For free copy circle No. 23 on postcard, p. 109.

Stud specifications

Commonly used welding studs and pins for use in your stud welding equipment are described in this booklet. The specification sheets included in the booklet are intended to establish economical minimum and maximum dimensions as standard. If studs with dimensions outside these established figures are required, the engineering and manufacturing facilities of KSM will make them to your specific requirements. *KSM Products, Inc.*

For free copy circle No. 24 on postcard, p. 109.

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Drill jig bushings

A booklet describing drill jig bushings is available. Manufactured in a complete range of standard sizes, from .055 to 1 3/4" hole, these are carried in stock at all times for immediate delivery. The bushings are simply designed, yet incorporate many special features. *Zero Index Co., Inc.*

For free copy circle No. 25 on postcard, p. 109.

X-ray diffractometer

The catalog illustrates and describes the way the Hilger X-ray diffractometer is used for qualitative and quantitative investigation of solid crystals by direct measurement of diffracted intensity using a high-speed ratio pen recorder rather than photography. A description is also given of the ways it can be used for studies of crystal-lite orientation, size and condition and in high and low temperature investigations. *Jarrell-Ash Co.*

For free copy circle No. 26 on postcard, p. 109.

Chain link fence

A new 44-page brochure and reference manual on chain link fence is profusely illustrated. The new edition features 25 different ways in which Continental chain link fence is serving the industrial, institutional, recreational, aviation and municipal fields. Continental fence provides greater strength and resistance, and longer fence life, made possible by Konik steel. *Continental Steel Corp.*

For free copy circle No. 27 on postcard, p. 109.

DirectoRod Guide

A 32-page DirectoRod guide describes over 300 low heat input metal joining applications and procedures. Time and money saving data in the 2-color book includes text and illustrations on welding and overlaying all base metals using all heating methods. Recommendations are given for welding cast iron without pre-heating and dismantling, and the use of low-cost alloys instead of silver. *Eutectic Welding Alloys Corp.*

For free copy circle No. 28 on postcard, p. 109.

Work holders

Multi-purpose work holders and holding devices are illustrated and described here. Actual job setups are shown. These versatile work holders with interchangeable attachments provide for jigs and fixtures to be assembled in quick order for an incredible number of operations. When the jig or fixture has served its purpose, it can be quickly disassembled and the parts returned to the board, being available for re-use. *Lassy Tool Co.*

For free copy circle No. 29 on postcard, p. 109.

Eddy-current brakes

This booklet describes eddy-current brakes and associated controls that satisfy numerous and varied braking requirements. A wide range of sizes and designs are available to meet most demands or can be built to suit individual conditions. Dynamatic eddy-current brakes, differing from friction brakes, have no mechanical contact between the rotor and stationary field; therefore operation is smooth and shock free. Standard units in both the air and liquid cooled types are described. Construction details, capacities, characteristic curves, dimensions, and advantages are listed. *Dynamatic Div., Eaton Manufacturing Co.*

For free copy circle No. 30 on postcard, p. 109.

Valves

OIC Valves for the L-P gas industry, which provide a safe, absolute seal and extra-long service, are described in a folder, complete with illustrations and charts giving pressure-temperature ratings and general dimensions. *Ohio Injector Co.*

For free copy circle No. 31 on postcard, p. 109.

Shop-pack

Literature describing the new "Shop-Pack" which contains wire thread inserts, a tap and an inserting tool for thread repair in the larger sizes has been published. The three-step operation of making permanent thread repairs in steel, cast iron, aluminum, magnesium, copper, plastics or wood is illustrated. *Heli-Coil Corp.*

For free copy circle No. 32 on postcard, p. 109.

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YOU CAN COUNT ON CONTINENTAL FOR EVERY FASTENER NEED!



Only Continental Offers You All 14 Types of Tapping Screws!

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Continental is the only producer making all 14 types of thread-forming and thread-cutting screws. These are part of Continental's vast selection of standard screw styles and sizes which number over 1,756,000.

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TECHNICAL BRIEFS

TESTING: A Time Saver

Production testing of a continuous load binder is more rapid when using this traction dynamometer... Test loads show instantly... Can be used to test many products.

A time saving method for production testing continuous load binders uses a traction dynamometer. Tension registers instantly in pounds on the dynamometer dial for checking against an established safety maximum for the unit tested.

The test, developed by Canton Mfg. Co., Canton, Ohio, is accomplished by anchoring one end of a load binder to the bottom of a vertical steel frame. The other end is secured in series with the dynamometer to a moving platen. By means of a hand-operated hydraulic pump, the platen is raised, thus applying load. Tension is instantly indicated on the dynamometer.

Test Many Materials

Similar tests on a wide range of materials such as chains, rods, cables, spot welds, etc., may be

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You may secure additional information on any item briefed in this section by using the reply card on page 109. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

made with this versatile instrument and an inexpensive test rig constructed from materials to be found in most any shop.

Dynamometers adopted for these tests are made by W. C. Dillon & Co., Inc., Van Nuys, Calif. They are available in ranges, from 0-500 up to 0-100,000 lb. Either 5 or 10 in. diam dials are optional. All models will withstand overloads up to 25 pct without injury to calibration.

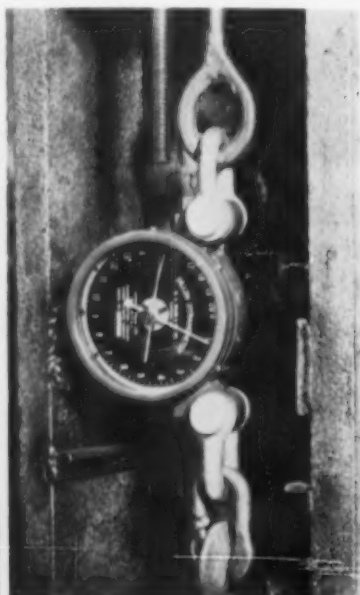
Approximate dynamometer dimensions are only 11½ x 2¼ x 5¼ in and lend themselves to many applications where test room is limited. Net weight is but 8½ lb.

Cleaning:

Automatic machine washes
120 drums per hour.

Washing steel drums at the Parlin, N. J., plant of Hercules Powder Co. is less troublesome than formerly. A new washing machine, designed and built by the Industrial Washing Machine Corp., Matawan, N. J., carries drums through the machine on a bar conveyor. Drum covers pass through at the same time on an overhead monorail which operates independently.

Entering drums are automatic-



Indicates load changes...

TECHNICAL BRIEFS

ally turned upside down for more efficient cleaning and are automatically righted as they emerge. Powerful sprays on the sides, top, and bottom of the machine insure a thorough wash and rinse job on 120 drums per hour.

The machine is 30 ft long, 7 ft wide, and 8 ft high. This installation is heated by steam, but others can be heated with gas or electricity.

Cold Forming:

New unit's twin rollers
flow metal to shape.

Blank disks of cold alloy steel are rotated and squeezed into difficult-to-form shapes by a new machine tool recently installed at Solar Aircraft Co.'s San Diego plant. The new Hydrosin machine, first of its type to be made by the Cincinnati Milling Machine Co., will cut costs by eliminating numerous operations formerly required to make jet aircraft and other high temperature parts.

The machine rotates a blank metal disk at high speed. As it spins two heavy duty steel rollers advance along a preset course to force the metal disk into the desired shape.

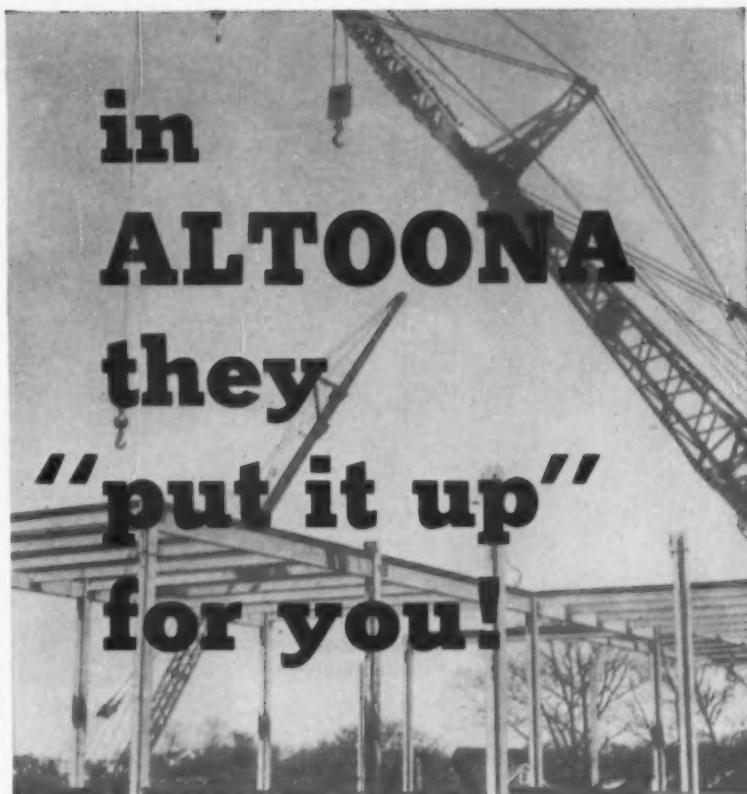
Power and Flexibility

The machine is semi-automatic—once the adjustments are set by an operator, various steps in the work cycle proceed automatically, except for loading and unloading. Hydraulic controls give the unit tremendous power plus unusual flexibility.

Solar will use the Hydrosin machine to manufacture high tem-



Start and finish . . .



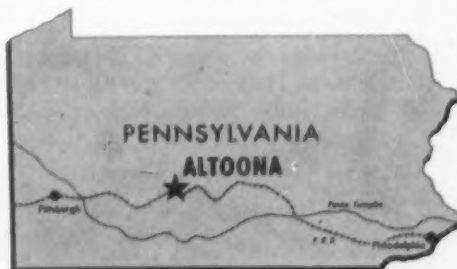
in
ALTOONA
they
"put it up"
for you!

ONE MILLION DOLLARS AVAILABLE TO HELP FINANCE YOUR NEW PLANT

Non-profit rentals or non-profit amortization! That's how you make more profits in Altoona, Pennsylvania. Altoona Enterprises, Inc., an experienced community-sponsored agency, helps you finance your new factory on a sale or lease basis. If you're worried about labor—*don't*. Altoona offers you 8,000 men and 3,000 women with excellent records for efficiency and good labor relations. Transportation? Altoona's right on the PRR mainline and just thirty miles north of the famous Pennsylvania Turnpike. Don't make a move until you've checked Altoona.

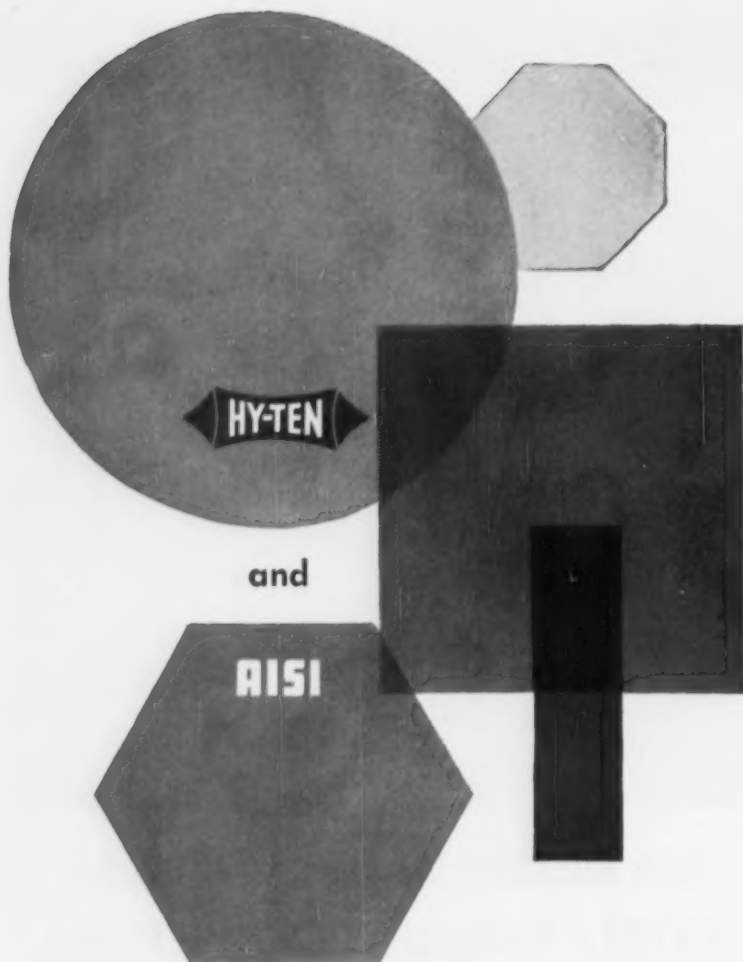
FACTS ABOUT ALTOONA

Next to steel-making industry • Dozens of sites with utilities, railroad sidings • Vocational training in 11 skills • Adequate, modern housing • Home of SKF, National Radiator, Sylvania, Butcher & Hart and many others.



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Altoona, Pennsylvania



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in sizes, shapes and treatments for every need!**

Wheelock, Lovejoy & Company, Inc., can fill your alloy steel requirements promptly. This applies to both standard AISI and SAE steels and to our own HY-TEN steels—"the standard steels of tomorrow". Take advantage of our seven strategically located warehouses. All of them can supply these steels in the form and quantity you need. Every warehouse, too, is staffed with expert metallurgists who are ready to serve you.

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126 Sidney Street, Cambridge 39, Mass.

TECHNICAL BRIEFS

perature parts, such as jet exhaust cones. It will save numerous forming, welding and machining operations.

Takes 42-in. Disks

For example, one part is now made from a hemispherical casting, with additional machining and welding bringing the total cost to \$40. On the new equipment the entire cost would be \$15, due to lower material and labor costs.

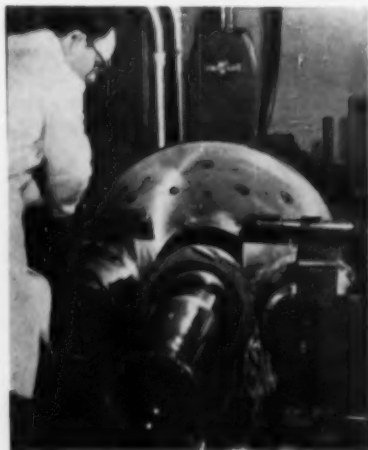
In operation the machine's two opposed rollers will cold-flow disks up to 42-in. diam onto the rotating mandrel. The machine has successfully formed 1-in. thick mild steels and $\frac{3}{4}$ -in. thick stainless steel.

Dome-Shaped Parts

Major use for the Hydrospon is the production of dome-shaped contoured parts. In the past they have been fabricated in two sections and welded together, requiring both special dies and fixtures. Now they can be simply formed from a blank disk. On many parts, only one-fourth as much material is required as compared to a forging, and production time is much less.

Stronger Parts Made

Another advantage claimed is that parts turned out by the new technique are stronger, with greater resistance to fatigue failure. When metal is Hydrospon, it undergoes a shear deformation. This elongates the grain structure, work hardens the metal, and increases tensile strength.



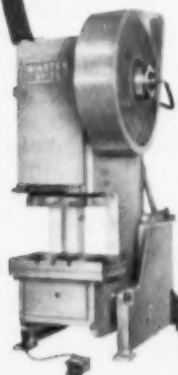
Forming the blank . . .

Minster announces a completely *New* STEEL FRAME GAP PRESS

SERIES G1 PRESSES

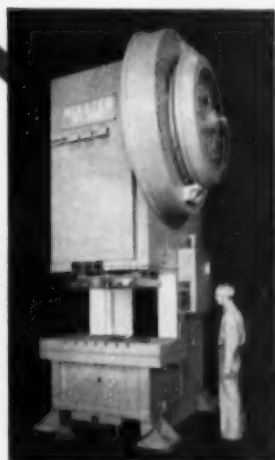
Patents Pending

Today's most rigid and efficient gap presses—G1 Steel Frames, are engineered and fabricated with a completely new approach to the problem of achieving minimum deflection in steel "C" frames for gap presses.



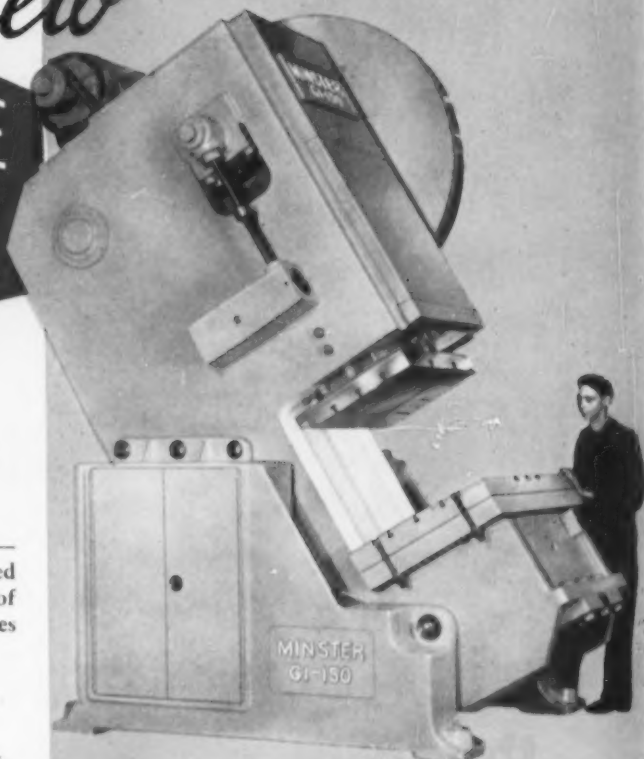
Series G1-75 flywheel type inclinable gap press with manual inclining and standard leg.

The 200 ton G1 fixed base geared type gap press—Available with either bed attached or sliding type die cushion.



CAPACITIES OF

- 75, 110, 150 and 200 Tons
- Fixed Base or Inclinable
- Flywheel or Geared Types
- Minster Patented Combination Air Friction Clutch and Brake
- Barrel Slide Adjustment and extremely long Slide Ways
- Power Inclining



MINSTER G1-150 ton geared type gap press—Motorized Inclining—Cabinet Legs house all electrical and air controls—Connect Air Line and Plug in power; in seconds, it's ready to operate.

CONDENSED STANDARD SPECIFICATION

CAPACITY	STD. STROKE of slide	STROKES per minute	BED AREA	SLIDE AREA
75 tons	4	Flywheel 90 or 120 Geared 40	24 x 36	18 x 24
110 tons	5	Flywheel 80 or 105 Geared 37	27 x 42	21 x 28
150 tons	6	Flywheel 80 or 105 Geared 30	30 x 50	24 x 34
200 tons	8	Geared 28	34 x 58	28 x 36

*Build a sound replacement program
modernize with Minster Presses*

MINSTER®

PRESSES

THE MINSTER MACHINE COMPANY, MINSTER, OHIO

April 21, 1955

the furnace

-250 ton open hearth

the product

-Laclede Silica Brick

the results

-a record 224 heats!

LACLEDE-CHRISTY does it again!

What more can you ask? Laclede-Christy Silica Brick completed 224 heats in the roof of a 250 ton open hearth furnace at a leading midwest steel mill. Based on a year's average, Laclede-Christy out-last ed other silica brick by 27 to 67 heats—for an average savings of at least 30%!

Is this the kind of refractory service you're looking for? Your source of supply—Laclede-Christy—is nearby.

LACLEDE-CHRISTY COMPANY

DIVISION OF H. K. PORTER COMPANY, INC.

2000 Hampton Avenue • St. Louis 10, Missouri
Mission 7-2400**Straightening:**

**High speed unit handles
many tube sizes.**

Electric welded steel line pipe from 4½ to 16 in. in diam is accurately straightened from end-to-end at 60 to 300 fpm speeds at the Lone Star Steel Co., Lone Star, Tex. These high production rates are accomplished with a Sutton 7-roll straightener built by Sutton Engineering Co., Bellefonte, Pa.

No Guides Needed

The 7-roll principle uses a large driven roll with two opposed idler rolls at the entry end of the machine and another identical cluster at the delivery end. Cluster rolls are positioned at approximately 120° to each other. Between the clusters is an unopposed pressure roll. This arrangement provides positive confinement of the tube to the pass line without guides of any kind.

In all rotary straightening, some loss in collapse strength must be allowed for. With the cluster design, this loss is considerably reduced. Because the tube is surrounded by the cluster rolls during the straightening process, ovality is held to a minimum. This is of particular importance in producing oil-country tubing.

Quick Setup Changes

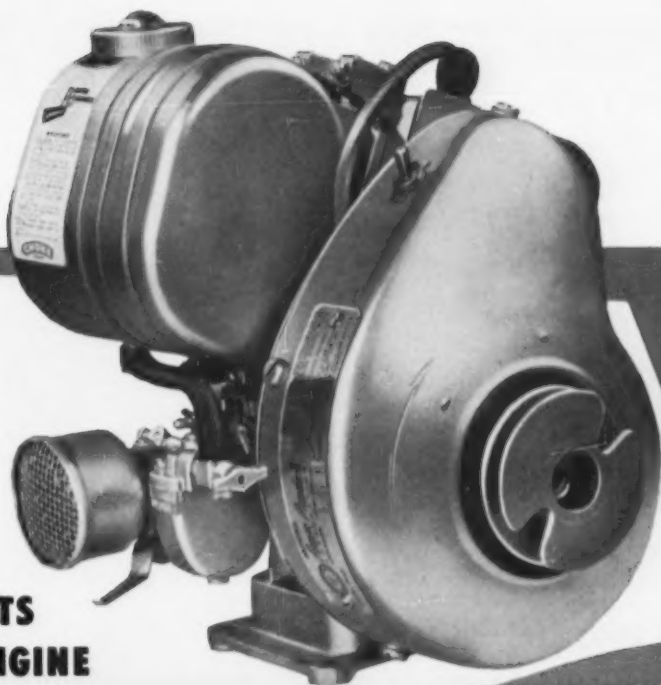
Automatic coordinated angling of rolls and power operated screw-downs make extremely rapid size changes possible. To shift the straightening setup from 5 in. OD tubes to 14 in. OD material for example, takes less than two minutes.

From a central control pulpit, a single operator controls his main motor and his straightening speed, making size adjustments by means of three motorized adjusting screws.

The straightener installed at Lone Star's plant is powered by a 150-200 hp, 350-1750 rpm, 230 v., adjustable speed dc motor. All roll necks, rotating shafts and universal joints are equipped with anti-friction roller bearings.

guess

**THE WEIGHT
of this
NEW 2HP
POWER PRODUCTS
INDUSTRIAL ENGINE**



**then read how SKF helps
make it less than you think!**

Here's Power Products Corporation's popular 2-cycle engine that delivers 2 horsepower.

How much would you guess it weighs? Fifty pounds? Thirty? Twenty? Guess any of these and you'd be wrong. It weighs just sixteen pounds.

This remarkable power to weight ratio is made possible, in a large measure, through the use of ball bearings at both ends of the crankshaft. Power Products engineers, like many others, recognized the inherent advantages of the 2-cycle principle—lightweight and compactness. The use of ball bearings on the crankshaft enabled them to virtually eliminate radial play with its related problems previously found in 2-cycle engines and produce a dependable small 2-cycle industrial engine.

The application of SKF bearings to this and other Power Products 2-cycle engines helps give the engines longer life, easier starting, consistent operation, as well as accurate timing, hotter spark and less friction which means more power.

SKF Field and Home Office Engineers know a lot of places where anti-friction bearings should be used to make your product better—places where their application produces benefits as it does for Power Products. Any of them, without obligation, will analyze the design of your product and perhaps show you how to make it better.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.,
manufacturers of **SKF** and HESS-BRIGHT® bearings.



SKF
BALL AND ROLLER BEARINGS

Welding:

New electrode for 90 pct of dissimilar metal jobs.

A new multi-purpose welding electrode is expected to give good, sound welds on better than 90 pct of dissimilar metal jobs in the average plant. Area of its greatest usefulness is expected to be in the joining of so-called ferritic materials, like mild steel, to the austenitic or stainless steel compositions. In addition, either of these compositions can be successfully joined to high nickel alloys such as Monel and Inconel.

Has Welder Appeal

To be useful, such an electrode must deposit weld metal with adequate strength, ductility and freedom from cracks in spite of dilution by dissimilar combinations. The electrode must also have a good measure of welder appeal.

For example, it must be operable in a vertical position, the slag must be readily removable, and the welds must be free of gas holes. All tests indicate the new Inco-Rod "A" electrode made by International Nickel Co. will meet these requirements.

Several pilot production lots have been made and tested on 20 dissimilar metal combinations. These include such examples as mild steel to 304 stainless steel, "Croloy" to 347 stainless, 405 stainless to 316 stainless, and Monel to 410 stainless.

Good Test Results

In all combinations, the welds were ductile and crack-free, and the joint strength was sufficient to force failure in the base metal in tensile tests. In addition, the corrosion properties of the weld deposits, in most cases were superior to the parent metals involved. It is expected that many other applications will become apparent as field trials are completed.

The new material comes in 14-in. lengths in diameters of 3/16 in., 5/32 in., and 1/8 in. There is also a 3/32-in. diam with a center grip. The electrode is an all-posi-



Same equipment—different jobs

Should you change wire rope constructions?

Under normal conditions there is one best size and type of rope for every wire rope using machine. This is the one you use day in and day out on routine work. But what about other conditions, the tough job, the unusual job? Suppose abrasion becomes a bigger factor, or unusual strength is needed, or more flexibility? Is a change of rope type in order?

Take a power shovel, for example. Moving dirt, sand, gravel, ore, it works fast handling smooth loads. If it is on a long job of clearing large rock, however, it will move slower and receive heavy jars and shocks. A different Red-Strand wire rope construction will probably absorb the shocks better and last much longer.

Take *your* equipment for another example. Whatever your business and however you use wire rope—if unusual conditions arise call in your Leschen technical man. Leschen makes all types, knows the special advantages and qualities of every one, and can help you choose the rope that will do your job best—on shovels or any type of equipment. Leschen wire rope is working profitably in every industry.

Your Leschen man can easily be reached through your nearby Leschen distributor. See him soon.

Depend on Leschen's higher-than-rated quality for longer-than-expected service.



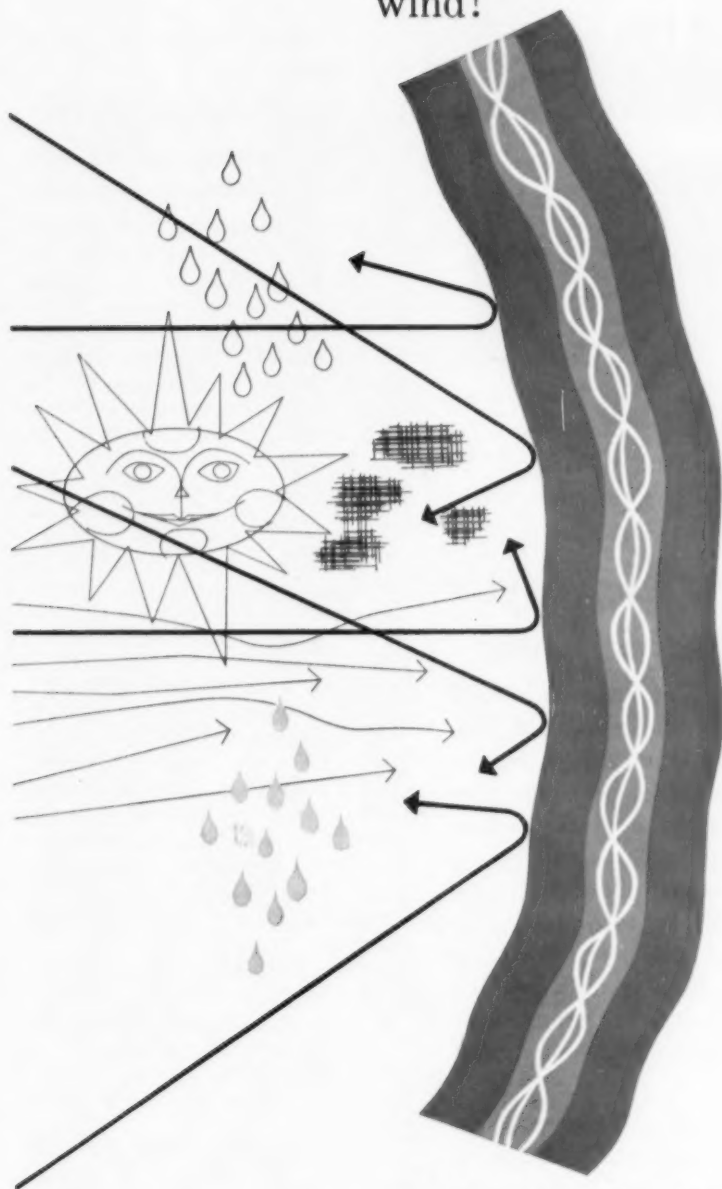
LESCHEN WIRE ROPE DIVISION

H. K. PORTER COMPANY, INC.

St. Louis 12, Missouri



this
wrap-around
shield
keeps out
more than
wind!



This is a cross section of a new paper developed by Cromwell as a wrap for sheet steel shipped by barge. Only Cromwell could "build-in" this wide range of protective abilities in a single sheet . . .

EXTRA-WATERPROOF
OIL RESISTANT
EXTRA-STRONG
SCRATCHPROOF
FLEXIBLE
VOLATILE
CORROSION INHIBITION

This new Cromwell sheet consists of two heavyweight sheets of kraft, blond laminated for high waterproofness, oil resistance and moistureproofness. It is reinforced with just enough specially selected glass fibers to provide strength and prevent a tear, but not enough to injure flexibility. The entire structure is embossed for flexibility. One wall of kraft is treated with Ferro-Pak VCI to prevent rust. Printed for brand or company identification.

A versatile paper like this may be just what you've been looking for. But whatever your needs, Cromwell "Paper Engineering" can give you the bag, cover or liner with the *right* combination of protective qualities. Write us about your problems.

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April 21, 1955

119

FIRST CALL FOR QUALITY



P AND *A* serves you the best in brass

With Plume and Atwood's special P^aA brass, you can improve your product and save money, too. It's made by a special process to give it a finer grain, a harder surface and a brighter lustre that means a better product with added customer appeal. Its superior quality costs no more and can save you up to 50% on finishing costs. Send us samples of your present brass parts. Our engineering staff is at your service.

- Brass, Commercial Bronze, Phosphor Bronze, Nickel Silver in Sheet, Strip, Mill Coils or Cut to Length.



THE *P* LUME & *A* TWOOD

MANUFACTURING COMPANY

THOMASTON
NEW YORK OFFICE

CONNECTICUT
220 BROADWAY

TECHNICAL BRIEFS

tion rod operated on direct current, reverse polarity.

Recommended amperages are: 3/32-in. diam., 40-65 amps., 20-24 volts; 1/8-in. diam., 75-100 amps., 23-25 volts; 5/32-in. diam., 90-130 amps., 23-25 volts. In general, preheat, postheat and peening are unnecessary.

Protection:

Fire detector unit uses radioactive element.

Bits of radioactive gold foil are the nerve center of a new fire detector system that warns of a fire before it becomes a roaring flame.

Developed by Pyrene-C-O-Two, Newark, N. J., the system can pinpoint the fire location, warn with an audible alarm, inform the public fire station, or actuate a sprinkler or other fire fighting system.

The Pre-Detector System is built around the detector head, which contains the radioactive element. Each head contains a highly sensitive gas discharge tube, plus two independent chambers. One is exposed to air and one sealed.

Ionizes Chamber Air

The radioactive foil is mounted in each chamber and ionizes the air to make it electrically conductive. Each chamber is adjusted to give equal voltage when combustion gases or smoke are non-existent. But when these gases are present, the exposed chamber changes its condition, setting up an electrical current.

This operates a relay causing the fire indicating cabinet to perform its function, which may be to sound an alarm, close fire doors, activate fire extinguishing system, or perform other fire protection functions.

A fire location cabinet can also designate the precise area of the plant or building where the activating pre-detector unit is located.

Company officials contend that the cost of installation of a single unit is about equal to a sprinkler installation. But the large area coverage by a single unit (60 ft apart and 30 ft from a sidewall) makes it increasingly economical as the area increases in size.



Could you wrap up 3000 psi a BETTER way ?

• The Mullins *Koldflo** Process cold extrudes this accumulator shell, which operates at 3000 psi, and withstands 12,000 psi burst pressure. For high-pressure service in hydraulic starting systems, this one-piece design is ideal. It eliminates assembly of forgings and tubing required with conventional designs, eliminates an O-ring seal as well.

Extruded with integral end to finished dimensions, *Koldflo* accumulator shells can wrap up *your* pressure problems better—and at less cost! If you require precision cylindrical steel parts in high volume, give us your specifications, and quantity required. We'll be glad to show you how *Koldflo* can turn your new designs into new and better products.

Mullins *Koldflo* extrudes this 4½" diameter accumulator shell in one piece. These extrusions can be furnished in a variety of shapes and sizes and with a choice of mechanical properties. Tolerances are extremely close as made. Surface finish measures 60 RMS or better, depending on shape.



"How would you tool-up to make an egg?" For copy of informative new booklet, write *Koldflo* Division, Dept. A-4 Mullins Manufacturing Corporation, Warren, Ohio.

*Trade-Mark Reg. U.S. Pat. Off.

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Koldflo

DIVISION

MULLINS MANUFACTURING
CORPORATION

Warren, Ohio

Phone: 2-1166



How About Pearlitic Malleable ?

Specify Pearlitic Malleable Castings

**FOR STRENGTH WEAR RESISTANCE
MANUFACTURING ECONOMY**

Pearlitic malleable is a specially processed malleable iron. It possesses an unusual combination of toughness, ductility and machinability.

- Pearlitic malleable has exceptional bearing properties—in many applications allows the elimination of brass or bronze bushings.

- Pearlitic malleable has high yield strength, from 45,000 to 80,000 psi to meet your requirements.

- Pearlitic malleable is easily machined and has excellent finishing qualities—readily acquires a smooth mirror-like finish.

- Pearlitic malleable can be selectively hardened by flame, induction or immersion methods for even greater wear resistance.

Write to the Malleable Founders' Society for names of foundries that make pearlitic malleable castings and for complete specifications.



Small Engine Crankshaft



Automotive Rocker Arm



Diesel Engine Piston



Universal Joint Yoke



1800 Union Commerce Building

Cleveland 14, Ohio

Construction:

Large Canadian bridge project completed.

Recent completion of the Angus L. Macdonald Bridge, linking the City of Halifax with the Town of Dartmouth, marks the end of one of the largest bridge building projects in eastern Canada in the past quarter century.

The present bridge, second largest suspension bridge in the British Commonwealth, has a total length, including approaches, of 5290 ft. The center span at Halifax is 1447 ft long.

Used 8227 Tons of Steel

Dominion Bridge Co., Ltd., was the prime contractor for the superstructure and was responsible for the fabrication and erection of the steel. Steel required for the Halifax job, including cables, was 8227 tons.

The bridge has a 27-ft roadway and a five-foot sidewalk. It also carries a ductway accommodating power ducts, telephone ducts, and inspection walks. An unusual feature of the bridge is the provision for it to carry a 30 in. water main from the Dartmouth side of the harbour when the City of Halifax outgrows its existing water supplies.

Towers Rise 309 Ft

The main towers of the bridge rise 309 ft from their bases and there is a minimum clearance beneath the bridge of 165 ft. The two main cables are 40 ft center to center and have a sag under dead load at the center of the main span of 133 ft 6 in. It is computed this sag will increase to 135 ft, when the water main load will be added.



New Canadian bridge . . .

THE IRON AGE



NEW PROCESS

TO FORGE REAR AXLE SHAFTS FOR AUTOMOBILE
on Hasenclever Electric Upsetting Machines and
Hasenclever Screw Presses

Better and more economical than anything ever known!

Ask for
detailed offers!

HASENCLEVER

Maschinenfabrik · Aktiengesellschaft
DUESSELDORF · GERMANY

Diecasting:

Specifications aid users
of diecast products.

An industry service, created to effect economies when specifying diecast components, has been made available by the American Die Casting Institute, national association of job shop diecasters. Known as "Product Standards For Die Castings," the service was prepared to aid designers and engineers avoid "overspecification" in part design.

The Product Standards Program when completed will comprise recommendations on engineering, metallurgy and commercial practices. A number of design recommendations in the engineering series are now available from ADCI, 366 Madison Ave., New York 17.

Engineering standards already available cover linear dimension tolerances, parting line tolerances, moving die part tolerances, draft requirements for walls, and flatness tolerances.



QUALITY CONTROL FOR MASS PRODUCTION. Days have been chopped to minutes by the installation of such equipment as this direct-reading spectrometer which can analyze beryllium copper alloys while they are still molten.

NEW MANUFACTURING FACILITIES INCREASE PRODUCTION, IMPROVE QUALITY OF "BERYLCO" BERYLLIUM COPPER

The production of beryllium copper, that uniquely versatile alloy which does so many jobs so well, has always been a complicated process. Beryl ore must be processed chemically to produce beryllium oxide. Master alloy is obtained by subjecting beryllium oxide, copper powder, and carbon to high temperatures in electric arc furnaces. Subsequent operations include ingot casting, soaking, annealing, pickling, hot and cold rolling, and drawing.

New technological advances—represented by a multimillion-dollar new investment in plant and equipment by The Beryllium Corporation—have successfully adapted basic quality control to large-scale production. Users of "Berylco" will reap the benefits. The spectrometer shown above, for instance, enables very close chemical control to be exercised in the production of the various beryllium copper alloys. New rolling mills produce strip to closer tolerances while enhancing over-all quality. These and other new tools produce sizes and forms not previously available—and in many cases have achieved economies which have already been passed on to users.

Write for engineering help or sample testing material.



ORE GRINDING MILL—a part of the fully integrated "Berylco" facilities.



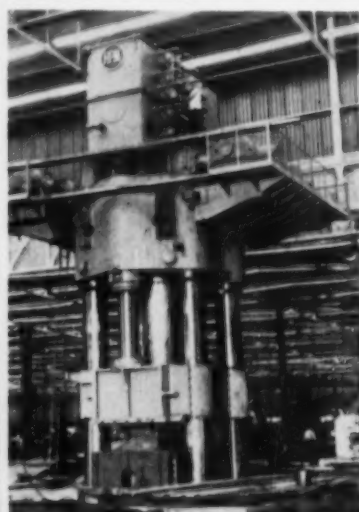
NEW COLD-ROLLING STRIP MILL finishes beryllium copper to close tolerances.



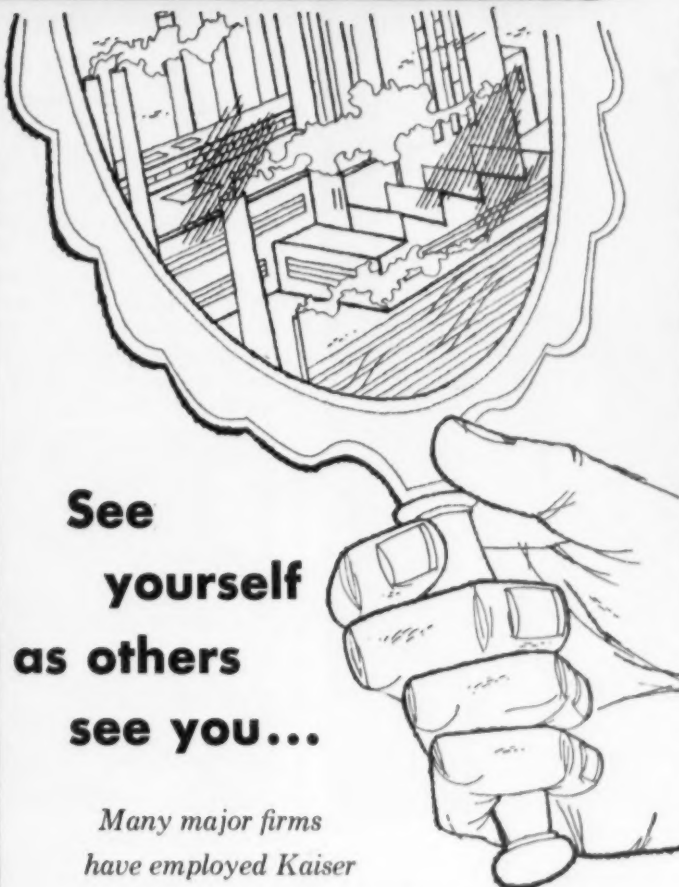
THE BERYLLIUM CORPORATION

DEPT. 5D, READING 6, PA.

STOCKED BY WAREHOUSE DISTRIBUTORS THE COUNTRY OVER



THIS 7000-TON hydraulic press will produce complex metal aircraft parts at McDonnell Aircraft Corp., St. Louis. Designed and built by The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, the press will deep draw complicated contours by a combination cushion and rubber pad process.



**See
yourself
as others
see you...**

*Many major firms
have employed Kaiser*

*Engineers to analyze their present
problems and appraise future needs
and prospects. Kaiser Engineers
is particularly well qualified to provide
this fact-finding service, for it
has a wide diversity of talents to prepare
engineering and economic feasibility
reports, market and site location studies.*

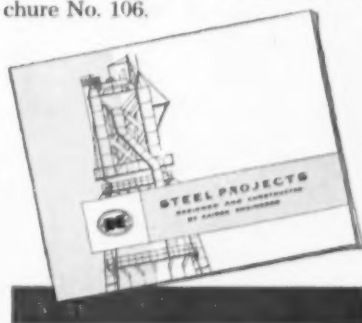


Like a Full Cut Diamond

the making of steel has many facets, presenting a variety of problems to management contemplating expansion or modernization. These problems can be simplified by a comprehensive study prepared by Kaiser Engineers. For example, an eastern steel mill was shown how to improve and increase its sintering facilities and at the same time provide for expansion.

Whether you plan to build or expand, a KE study will provide you with facts in advance.

Write today for your copy of Kaiser Engineers' new steel industry brochure No. 106.



kaiser engineers...for low operating costs

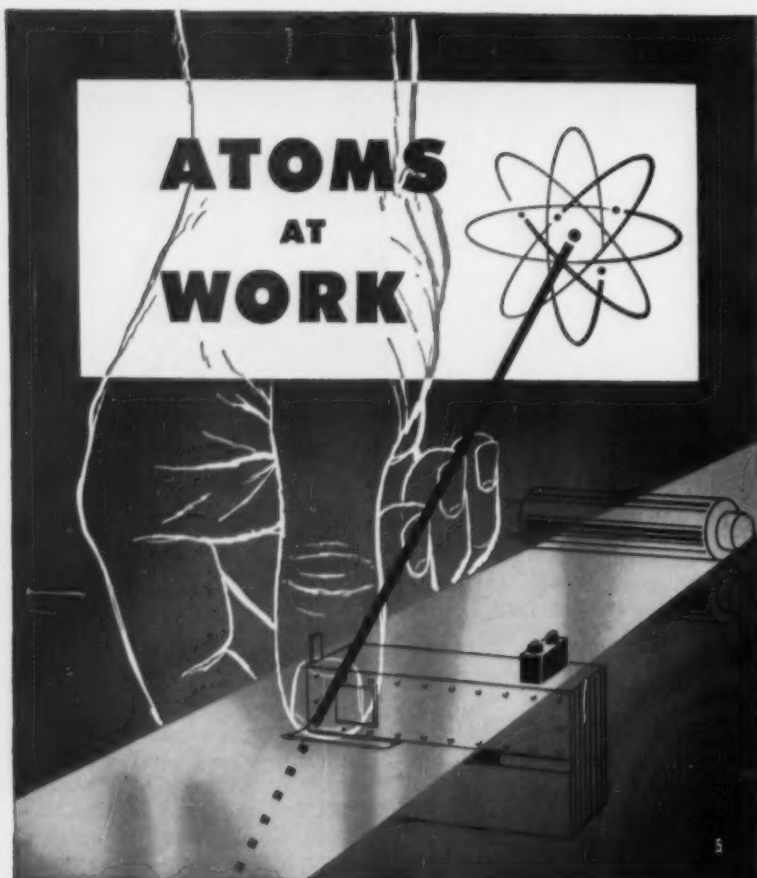
DIVISION OF HENRY J. KAISER COMPANY

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April 21, 1955



AT WALLINGFORD STEEL

At Wallingford, harnessed atoms precisely control steel thickness and assure important improvement in uniformity . . . *automatically*. Here, radioactive isotopes of strontium or ruthenium demonstrate their superiority over mere man. Electronic continuous gages check strip, ranging down to .002" and to tolerances as close as .0001", without touching the metal to mark or otherwise affect it. *Man alone is unable to control steel thickness so accurately . . . so fast!*

This practical application of atomic energy to improve our quality control is another reason why you can be confident that Wallingford will meet your most rigid specifications for stainless steel strip and tubing *exactly* . . . another reason for arranging to use Wallingford's ultra-modern facilities *soon*.



WALLINGFORD, CONN., U. S. A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP AND TUBING

TECHNICAL BRIEFS

Gaging:

Simple mirror aids cylinder block honing.

An army machinist corporal rigged up a mirror to eliminate guesswork in the operation of cylinder block honing machines. In setting up the machine for automatic operation, he observed that a certain amount of guesswork was involved in determining the depth of penetration into the cylinder and that an improper depth setting often caused machine breakage.



Mirror magic . . .

To eliminate guesswork and save time and breakdowns, he set up a universal mirror underneath the honing machine along with an electric light attachment. This allows the operator to check depth of penetration by looking down through the adjacent cylinder cavity from his normal standing position. It eliminates crawling under the cylinder block to check depth settings and resettings.

Cuts Waiting Time

Steel pallets which fit the table of a blast cleaning machine exactly have allowed Florida Machine & Foundry Co., Jacksonville, Fla., to absorb loading time into the machine operating cycle.

The cleaning unit, a Pangborn 8 ft Table-Room, blasts a pallet load of castings clean while operators are loading a second pallet and preparing it for positioning in the machine. Time operators used to spend waiting for the machine to finish a cleaning cycle is now used productively.



WEIRTON

GALVANIZED SHEETS

*for long-lived
roofing and siding*

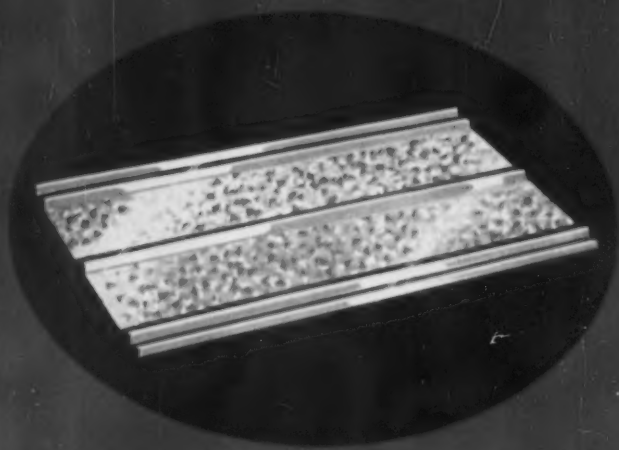
There's an easy way to solve roofing and siding problems quickly, dependably, economically. That's the Weirton way—with Weirton galvanized steel sheets. Their tight zinc coating resists cracking, peeling and flaking. The strength of steel plus the corrosion resistance of zinc gives added years of life. And long experience shows that galvanized sheets give more protection, with less maintenance and at lower cost.

Weirton's modern production processes, plus close quality control all along the line, make Weirton galvanized sheets a best buy for your roofing and siding needs.

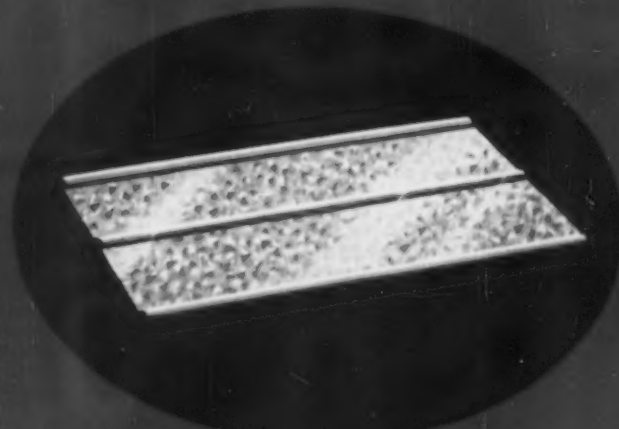


WEIRTON STEEL COMPANY
Weirton, West Virginia

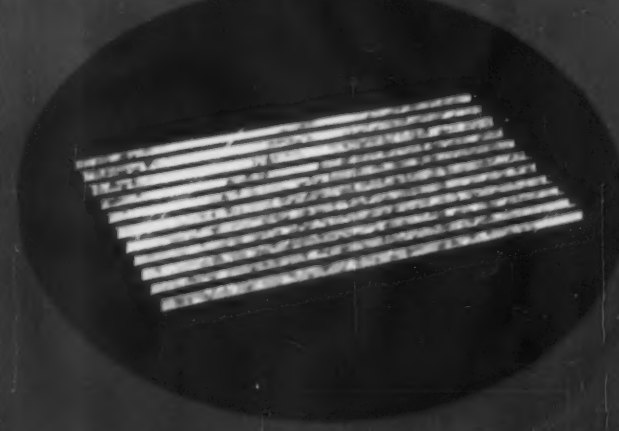
NATIONAL STEEL CORPORATION



Famous Weirton "Safety Drain" galvanized steel sheets combine maximum protection with outstanding good looks.



Weirton galvanized V-Crimp sheets are made in 2V-, 3V-, and 5V-crimped, and in gauges 26, 28 and 29; covering width, 24 inches.



Weirton galvanized corrugated steel sheets are most economical in first cost, and are the strongest form of steel roofing because the corrugations strengthen the entire sheet.

REDUCE CYLINDER HANDLING

Up to 50% with INDEPENDENT Gas Supply Trailers!

Here's the newest idea in gas service! Leave a full gas trailer with your customer . . . replace it with another when empty. Reduces cylinder handling up to 50% . . . cuts cylinder costs . . . gives customers the convenience of having uninterrupted gas supply.

Many gas manufacturers and haulers of compressed gas (including many government agencies), are already enjoying the many advantages of INDEPENDENT Gas Supply Trailers.

Available for all gases as authorized by ICC.



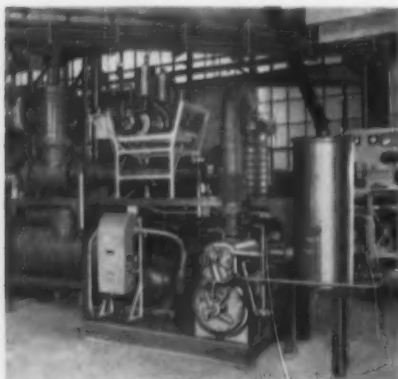
INDEPENDENT ENGINEERING COMPANY, Inc.

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Manufacturers of
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Your
Inquiries*



**VACUUM IN
METALLURGICAL
RESEARCH**

CLIMAX-MOLYBDENUM is exploring the potentialities of vacuum metallurgy, using this pilot vacuum casting system with its Kinney High Vacuum Pumps in the development of high purity alloys. Here again, the known performance of Kinney Pumps helps lead the way into the unknown wonders of vacuum.

If you need vacuum — for research, pilot plant, or full production — consult Kinney. We offer the broadest line of pumps (capacities 2 to 1800 cu. ft. per min.) — plus engineering and application experience unequalled anywhere. Write for Bulletin V-54 and Catalog 400.

**Kinney Manufacturing Division, The New York Air Brake Co.,
3634 Washington Street, Boston 30, Massachusetts.**

Turning:

Carbide tool solves high-impact turning job.

Frequent stops for tool regrinds during a high-impact turning job on a special aircraft shaft of SAE 4340 steel was a problem for Syncro Devices Inc., Detroit. Switching to a carbide cutting tool allowed the tool to turn a complete shaft without interruption and also doubled production.

The operation was done on a Warner & Swasey turret lathe using a Carboloy Grade 370 tool. First cut was a square shoulder at the approximate center of the 2 3/4-in. diam by 8 7/8-in. shaft. The shaft was then repositioned so that it turned in the lathe 0.400 in. off center for the balance of the cut.

This formed an eccentric feature for half the shaft length. It required a severe interrupted cut of about 3/8-in. depth on one side, and nothing on the other. The cut was made at 64 rpm with a 0.004-in. feed. Soluble oil was used as the coolant.



Eccentric shaft . . .

New Books:

"Short Term Economic Forecasting," is one of a series of books to come from the Conferences On Research In Income and Wealth sponsored by the National Bureau of Economic Research. It presents seven penetrating analyses of the problems of predicting the behaviour of economic variables over one or two years. In addition it evaluates the results and methods of scientific forecasting programs.

The complexities of modern

TECHNICAL BRIEFS

business have forced upon the businessman increasingly difficult standards for the decision-making process. For help in making decisions, and in evaluating both short and long term trends, the businessman has turned more and more on the forecaster.

The forecaster in turn has carried his profession away from the realm of art towards the status of a science. He is charged with the responsibility of spotting trends quickly, assessing them accurately. To help in this important task this book appraises statistical techniques available to the forecaster.

Leading authorities who have contributed to the book include: Louis Bassie, Irwin Friend, Jean Bronfenbrenner, O. J. Firestone, Franco Modigliani, Owen Sauerlender, Thor Hultgren, John Lansing, Stephen Whitey, Irving Schweiger. The Princeton University Press, Princeton, N. J., \$7.50.

"Steam, Its Generation and Use," 37th edition. In the many years since it was first published, 1875, this tremendous book has gained recognition as an authoritative text on all phases of steam engineering.

Every phase of modern steam power knowledge is covered in detail: Sources of energy, the engineering principles upon which the technology of steam and its use are built, design, metallurgy. The 29 chapters present a wealth of engineering knowledge.

Special arrangements have been made for the distribution of the book, through college professors and instructors, to mechanical engineering students in applied thermo courses of recognized colleges in the United States. Through commercial book stores the price will be \$10.00. The Babcock & Wilcox Co., 161 E. 42nd St., New York 17.

"Engineering Metallurgy," by Dr. E. M. H. Lips. A study of metals in relationship to present day construction techniques. Presents data about the qualities of new materials. Elsevier Press Inc., 155 E. 82nd St., New York 28. 250 p. \$6.25.

NEW ADJUSTABLE I. D. GROOVE GAGE

These
3 gages measure
groove diameters



from .495" to 6.00"

FEDERAL Model 99P Series Indicator Gages measure inside diameters of retaining grooves such as those for sealing or retaining rings — also other internal dimensions including shallow recesses, and similar conditions.

Each gage has an exceptionally wide gaging capacity: the set of three measures from .495" to 6.00" inclusive. Diameters smaller than .495" can be checked, depending how far in from the face of the hole the groove is located.

These gages are designed so the weight of the gage and operator's hand rests on the lower fixed anvil, eliminating inaccurate readings due to weight on the sensitive contact.

Extremely convenient to use, fast, and reliably accurate, these new gages represent the latest in the positive, accurate gaging of groove diameters.

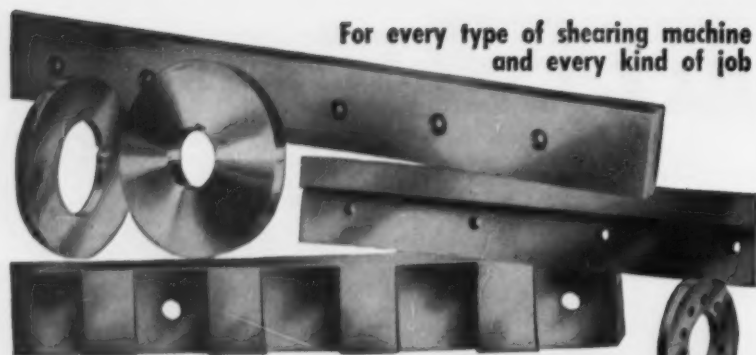
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FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or electronic — for inspecting, measuring, sorting, or automatically controlling dimensions on machines.



For every type of shearing machine
and every kind of job

"multicut"

SHEAR BLADES and ROTARY KNIVES

R Engineered to the job . . . Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

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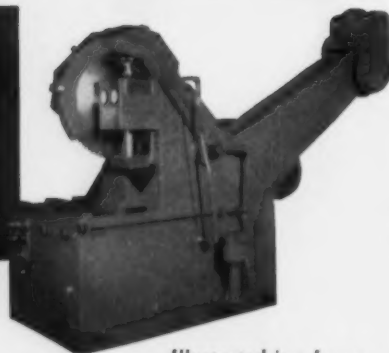
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Why do the leading manufacturers of metal cutting machinery use Gusher Pumps on their machinery? They've found Ruthman Gusher Pumps are dependable — give split second coolant flow from the moment the machine is turned on. And Gusher Pumps require a minimum of attention — they're pre-lubricated, need no priming or packing. Specify Gusher Coolant Pumps — Write us for catalog.



Illustrated is a Loma Hydraulic Billet Saw equipped with a Ruthman Gusher Coolant Pump.

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TECHNICAL BRIEFS

Melting:

**Zone melter built at NBS
for metal studies.**

An automatic laboratory-type zone melter recently constructed at the National Bureau of Standards combines versatility and dependability with unusual simplicity and ease of operation. The device is now being used in the Bureau's solid state physics laboratory to obtain extremely high-purity semi-conducting materials.


In the NBS zone melter, the solid material to be purified is placed in a fused silica or carbon boat within a vycor tube. A water-cooled induction coil, concentric with the vycor tube, is then made to pass slowly along the length of the solid material.

The resultant heating effect produces a small molten zone in the bar of material. This molten zone moves along the length of the bar with the coil, causing a continuous separation of impurities at the zone boundaries.



FAST, RESIN BONDING of shell-mold halves with a new shell-bonding machine eliminates the use of mechanical fasteners. The new unit, recently added to General Electric Co.'s experimental shell-molding laboratory, applies spring pressure to bond the hot cope and hot drag mold halves.

THE FERRY CAP countr-bor SCREW



A NEW, REVOLUTIONARY DESIGN
FOR SOCKET HEAD SCREW APPLICATIONS

12-POINT HEAD

OFFERING THESE NOTEWORTHY ADVANTAGES:

1. Takes standard 12-point socket wrench.
2. External wrenching instead of internal.
3. Stronger—more gripping surface.
4. Permits greater wrenching torque.

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In brief—a quality product which will do everything required of socket head screws—and more. For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

We shall be glad to send samples, prices and complete information promptly upon request.

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**“WOW! what happened
to our labor cost
on this run?”**

How many times—and how recently—have you asked this question? It's a good one, with a lot of possible answers. The important thing is, can these skyrocketing costs happen again, or have the causes been corrected? Often the answer is very simple—and easily remedied.

**Could this
be your
answer?**

A batch of castings or forgings with cracks that nobody found until costly hours had been wasted machining and finishing them . . . a heat treat that went sour . . . improper grinding, handling, cleaning, all are possibilities, and all can vary from run to run.

Cracks, whatever the cause, run up your labor costs if you don't find them *early* enough. Early enough to find

and correct the cause before parts are run and finished in quantity, only to be scrapped.

Inspection is low cost with Magnaflux' Methods and it finds all cracks...helps you find the cure. It can save you many times its trifling cost.

Ask to have a Magnaflux engineer give you facts and figures—or write for new booklet on **LOWER MANUFACTURING COST.**

MAGNAFLUX



MAGNAFLUX CORPORATION

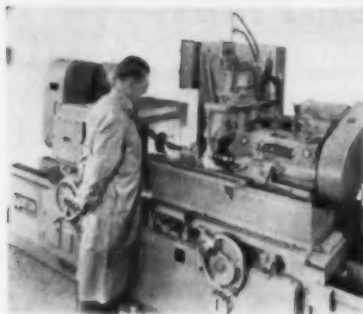
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NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 109 or 110



Faster grinding and better finish of camshafts

Simpler and sturdier construction details of the No. 3 Cam-O-Matic automatic cam grinder provide faster grinding of automatic type camshafts with better finish. Positive work drive contributes to better cam form and finish. The machine has two automatically controlled work speeds: the higher speed adjusted for optimum rate of stock removal; the slow speed, the

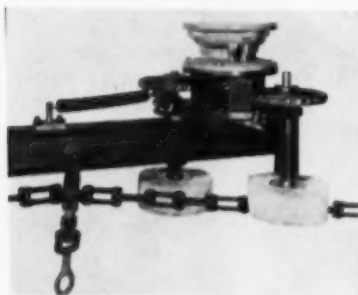
best rate for accuracy of contour and fine finish. Change of speeds is automatic and its timing can be easily adjusted. Grinding action has been improved through use of heavier one-piece rocking bar of increased cross sectional area. Automatic wheel guard truing is a feature, and built-in automatic compensation for wheelwear. *Norton Co.*
For more data circle No. 33 on postcard, p. 109.

Contour projector permits in-the-shop inspection

The Covell No. 14 optical comparator is a complete checking instrument which provides accurate measurement of difficult dimensions. It is simple to operate, all measurements being taken by direct readings from precision-built indicators. A large work capacity,

sturdy, precision construction and an optical arrangement permit it to be used in bright light in the shop. The optics are highly precision ground and coated to give extreme accuracy, and bright, halo-free images. *Covell Mfg. Co.*

For more data circle No. 34 on postcard, p. 109.



Brusher cleans overhead conveyor chains

Dust and dirt that sticks to lubricating oil on hard-to-reach overhead conveyor chains can be automatically eliminated without work stoppage, by using a new brusher. The unit, comprised of two sets of Fullanchor wheel brushes, is mounted on the monorail supporting the chain conveyor. Brushes, powered by a 1 hp motor, pivot on the motor

base and bear against the conveyor chain. They can be swung away from the chain if periodic cleaning is desired. Material for the wheel brushes is selected to provide the most efficient brushing action for the individual problem. Each machine is custom engineered. *Fuller Brush Co.*

For more data circle No. 35 on postcard, p. 109.

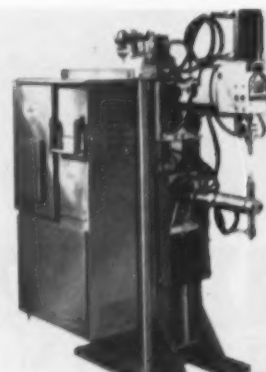
Resistance welding of medium gage sheet metals

This Delta spot welder designed for high duty cycle resistance welding on medium gage sheet metals has a fabricated steel frame of formed boiler plate. Upper head construction offers a hardened and ground, lubricated slide riding in adjustable V gibs for maximum bearing and precision alignment. This construction results in smoother head travel, reduced friction and inertia qualities. The model is equipped with an air cylinder of sufficient capacity to

handle a wide range of metal thicknesses, resulting in rapid follow-up essential to good welding. Lower arm is adjustable in a vertical direction from 13 in. between arms in a closed position to 23 in. in an open position; is adjustable in a horizontal plane from standard throat depth of 18 in. to within 9 in. of the machine face. *Delta Welder Corp.*

For more data circle No. 36 on postcard, p. 109.

Turn Page



Bale It the G-H Way...

Make Sheet Metal Salvaging a Profitable Operation in Your Plant

Wherever sheet metal scrap accumulates in volume, it presents two problems: *First* — neat, orderly disposal with minimum disturbance to plant operation. *Second* — profitable salvaging.

A well integrated scrap salvaging operation, built around the right size and type of baling equipment, can solve *both* problems for you just as it has for many others.

The Galland-Henning Hydraulic Baling Press is fast, powerful and rugged . . . designed and constructed to convert stampings, clippings and other loose scrap into dense, compact bales at lowest possible cost per ton . . . bales that always command premium prices on the scrap metal market.

If you need help in planning Profitable Salvaging of your sheet metal scrap, you can rely on Galland-Henning for competent counsel based on years of successful experience in the design, construction and installation of scrap metal balers.

GALLAND-HENNING MFG. CO.

2725 SOUTH 31ST STREET • MILWAUKEE 46, WISCONSIN



GALLAND-HENNING

SCRAP METAL BALING PRESSES

A 7536-1P



All moving parts enclosed on low-cost Honite barrel

Called the VS Model, a low-cost, standard-model barrel finishing machine has many features of the deluxe models. All moving parts are enclosed. Safety features include a pivot-mounted gate which closes when the machine is in operation, and a magnetic brake. All lubrication points are readily accessible; motor, speed reducer, speed changer

and brake are mounted in a single unit at the rear. The steel frame has oversize pillow blocks and self-aligning bearings which are capable of carrying full loads of steel burnishing media. The VS is available in three power ranges, with 1½, 2 and 3 hp motor. *Minnesota Mining & Mfg. Co.*

For more data circle No. 37 on postcard, p. 109.

Way-protection for hard-worked machine tools

Fabricated to order from a neoprene-base material the accordion type way-protectors afford low cost protection against flying chips, dirt, contaminated oil and scoring, scratching and grooving. On a way 20 ft long this pliable protector requires approximately 24 in. for mounting on the end of the upper

bed plate. Protectors shown are on a horizontal drilling and milling machine. They open to 24 ft and close down to 18 in. In Navy tests the neoprene-base material has withstood temperature extremes from -45° to +220°F without cracking. *A&A Mfg. Co.*

For more data circle No. 28 on postcard, p. 109.

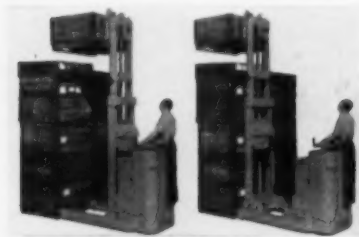


Stacker features retractable fork assembly

Fifty per cent greater reach and a third greater load capacity are offered by this new rider-operated electric stacker. The truck has the fork and mast assembly—not just forks alone—extending and retracting within the track frame.

Designed for tiering and detiering in aisles as narrow as 6½ ft, the ESRT can carry 4000 lb with a 36 in. pallet. Fork and mast assembly extends and retracts 36 in. *Automatic Transportation Co.*

For more data circle No. 39 on postcard, p. 109.



Transfer machine designed for complete automation

A special Impeco transfer machine performs all the milling, drilling, reaming, and checking operations on a V-8 engine rocker arm shaft. Complete machine cycle is 10 sec with a gross production of 360 parts per hr. Parts are loaded into pallet-type workholding fixtures, positioned endwise automatically, and clamped with a power wrench.

Transfer system is hydraulic, including return transfer unit. Drilled holes are automatically checked at the next station and deburred at the last station after milling operations. Machine has automatic lubrication, automatic chip conveyor, and pallet wash. *Industrial Metal Products Corp.*

For more data circle No. 40 on postcard, p. 109.



Deep throat contour saw meets job shop needs

New 30-in. contour saw fills the needs of job shops for a low-cost deep throat machine. It is engineered and powered for straight or curved metal sawing operations and is adequate, therefore, for sawing woods, plastics and other materials. Through the addition of simple and inexpensive accessories the machine can perform band filing at extremely rapid rates, metal polishing, finishing and slicing. Carbide tools can be finished ground on these ma-

chines. Frame construction of the new models reflects the same heavy gage steel and welded box frame design found in DoAll's more expensive models. Worktable 24 x 24 in. assures rigidity and area needed for handling heavy or large pieces. Ruggedness and power of machine give the cutting speed and finish needed for tool room or light production work. *DoAll Co.*

For more data circle No. 41 on postcard, p. 109.

Turn Page



Automation embraces assembly operations

High production in a limited work area features a double end drilling and assembly machine with a trunnion type automatic index table. The index table is mounted in a vertical plane to save floor space. All operations, both production and assembly, are fully automatic. The machine drills 2 holes for the heat control butterfly in a manifold; reams the 2 holes; drills the stop

pin hole; hopper feeds 2 bushings; presses the 2 bushings in place; stakes the 2 bushings; reams the 2 bushings; hopper feeds the pin; and, presses the pin into place—all automatically. Production rate is 120 manifolds per hr with bushings and pin in place. All units of the machine are hydraulically operated. *Michigan Drill Head Co.*

For more data circle No. 42 on postcard, p. 109.

Reach fork truck

Heavier carriage and unrights, larger rams and a revised power unit give a new power reach fork truck capacity to handle 3000-lb loads. Telescoping upright mem-



bers are of formed steel. Elevation sections ride on guide rollers having large oversized bearings and bigger bearings are used on the carriage rolls. This heavy duty truck operates in 6 ft aisles; handles pallets or skids of varying sizes. *Raymond Corp.*

For more data circle No. 43 on postcard, p. 109.

Far-infrared heaters

For industrial baking, drying, curing and dehydrating operations, two new-type, all-metal far-infrared electric heaters have been made for industrial baking, drying, curing and dehydrating operations. One type is equipped with standard medium screw base; the second type has bi-post terminals, and both can be used to replace infrared glass lamps. Both heaters are sheathed in Inconel. *Edwin L. Wiegand Co.*

For more data circle No. 44 on postcard, p. 109.

Turn Page

no fuss...no muss

WHEN YOU BEND WITH A PEDRICK

Pipe, tube and structural bending with Pedrick Production Benders is the smoothest, simplest, cleanest operation you can imagine. Even usually difficult bends are a cinch, and the costs—really low!

Write us your bending problem—we think we can supply a cost-cutting answer. PEDRICK TOOL & MACHINE CO., 3640 N. Lawrence St., Philadelphia 40, Pa. Dept. 3.



FREE "PEDRICK LINE"
BULLETIN. WRITE TODAY.

PEDRICK

production benders

ALLOY STEELS PAY OFF CASE HISTORIES	
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60 fully documented
case histories

Facts on
maximum pay load

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toughness, wear, strength

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Please send me the 208-page handbook
"Alloy Steels Pay Off"

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**MAIL
THIS TODAY**

If you use steels, here's the handbook you should have



This fact-packed handbook is a must for you if you use steel. Here, in completely documented form, you'll find how the use of alloy steels adds economies, increases service life, offers many other advantages.* Cost-conscious executives will find the full story on these economies of alloy steel in the first section of the handbook. Designers and metallurgists will find the advantages of alloy steels in the 60 case histories. Get your copy today. Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.

MSS-18

* Advantages of ALLOY STEELS

- longer life
- greater pay load
- lower operating costs
- greater safety
- less maintenance

CLIMAX MOLYBDENUM

April 21, 1955

137



Surface mill removes more metal with fewer passes

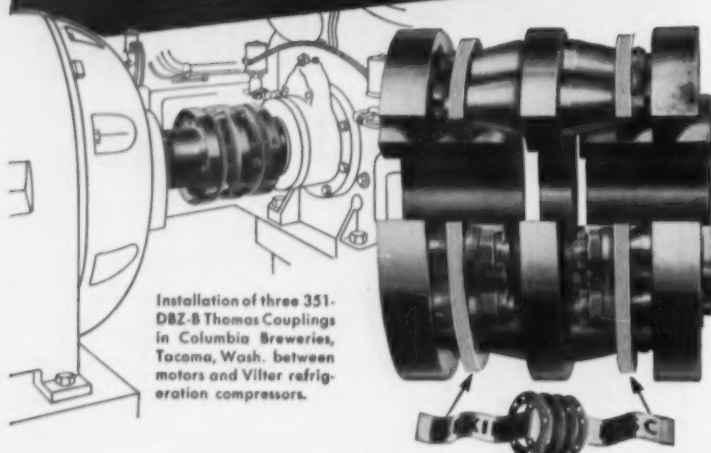
Five-fluted spiral surface mill, tipped with carbide removes more metal with fewer passes than conventional surface mills it is stated. Designed for nonferrous metals, including aluminum, brass, copper, etc, and for plastics, the mill is said to give a superior finish and more accurate cut with less strain on

equipment. Lower power consumption, less downtime, and longer tool life are other advantages. The 9-in. long mill has five spiral cutting surfaces of carbide, each curved to run 2/3 of the way around the tool. This design gives multiple, angular, continuous cutting action. *Relco Carbide Tool Co., Inc.*

For more data circle No. 45 on postcard, p. 169.

THOMAS FLEXIBLE COUPLINGS...

for more years of better service!



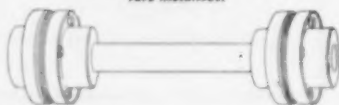
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



Instant dry metal coat

One coat of Totrust instant dry metal coat penetrates and stops rust. It dries in less than 5 min to a durable, ready-for-use coating. This one-coat primer finish or rust preventive undercoat has high chemical resistance. It is suited for new or rusted metal, damp or dry surfaces, painted or unpainted, indoors or out, including aluminum and galvanized. Comes in red, zinc chromate, wrought iron black, stainless steel, in handy spray bomb form. *Wilbur & Williams Co.*

For more data circle No. 46 on postcard, p. 169.

Power stem saw

Easy-to-use powered saw trimmer zips through the stem of a self-plugging blind rivet in a fraction of a second. The tool is a miniature circular saw 1 in. in diam encased in a spring-loaded adjustable sleeve



that guards against cutting or nicking the riveted sheet. It can be used to trim stems of both flush head and protruding head Cherry rivets of all diameters. It fits standard quarter-inch electric or air drill. *Townsend Co.*

For more data circle No. 47 on postcard, p. 169.

Turn Page



**What
shape
is a
quality
fastener?**

Here is a handful of ELASTIC STOP® nuts. Each has ESNA's familiar red locking collar . . . is self-locking and vibration-proof. Each is a readily assembled, one-piece unit. Each provides positive protection against thread corrosion . . . prevents liquid seepage along bolts. Each is made from the finest of raw materials. Each is exactly controlled as to finished dimensions, class of thread fit and finish. Each is now in use on critical applications, with a record for uniform high quality that is unmatched.

Most of them are standard parts. Some originated as the result of a specific request for ESNA's help with an important fastening problem.

Isn't it logical to call on us with your next fastening problem?

ELASTIC STOP NUT CORPORATION OF AMERICA



Elastic Stop Nut Corporation of America
Dept. N62-477, 2330 Vauxhall Road, Union, N. J.

Please send the following free fastening information:

☐ ELASTIC STOP nut bulletin

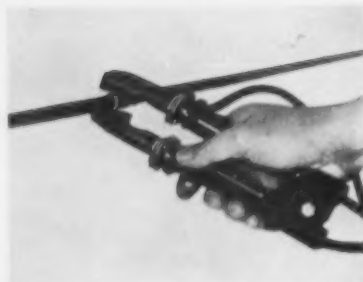
☐ Here is a drawing of our product.
What self-locking fastener would
you suggest?

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____



New pliers tool solders copper tubing fast

Used primarily for soldering copper tubing sweat fittings up to 1 1/4 in. size, the new plumbers' portable soldering set consists of an all-electric pliers soldering device in conjunction with a 100-w portable power unit. The equipment features safety and ease of use as there is no open flame, burn or fire hazard.

It operates from the nearest power outlet; is fast to rig and start work. Soldering time for 1/2-in. OD tubing fittings is 20 sec. The tool also works with ease and efficiency on heavy electrical wire and cable, and many other heavy soldering jobs. *Wassco Electric Products Corp.*

For more data circle No. 48 on postcard, p. 109.

WEBB PLATE FABRICATING MACHINERY

Steelworkers ALL STEEL CONSTRUCTION

The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.

Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structurals.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. E.



Let Speed **PAY**-The **WEBB** Way!



SLIP ROLLS



PYRAMID TYPE ROLL



INITIAL TYPE ROLL



STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

Since 1881
THE WEBB CORP.

WEBB CITY, MO., U. S. A.

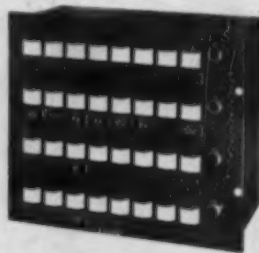
Makes stainless surface

New process gives advantages of stainless steel to ferrous metals. It diffuses chromium into ferrous metals and forms a stainless surface alloy to depths from 0.001 to 0.008 in. and without causing dimensional changes. It reportedly permits ferrous metals to resist corrosion under most severe atmospheric, water and chemical corrosion conditions; resist thermal oxidation at temperatures to 1700°F; and resist wear and abrasion under a wide variety of difficult applications. The surface will not chip, crack, peel or gall even when the processed product is bent 180°, stretched or twisted. *Alloy Surface Co.*

For more data circle No. 49 on postcard, p. 109.

Multifunction alarm

Versatile annunciator system performs a three-fold function. In addition to alerting any off-normal condition in a manufacturing process by means of visual and audible alarm, it also gives indication of



the first failure in a sequential operation. And by means of an interlocking circuit, it automatically selects and monitors the correlated safety auxiliary shut-down equipment. Standard unitized components are used throughout the entire system. *Industrial Automation Co.*

For more data circle No. 50 on postcard, p. 109.

Superfinishing machine extends carbide tool life

On this inexpensive super finishing machine a highly finished lapped cutting edge is said to be obtained in a few seconds with negligible diamond cost. A small diamond impregnated finishing hone laps the cutting edge of the carbide tool with a reciprocating movement in 4 directions in a vertical plane until

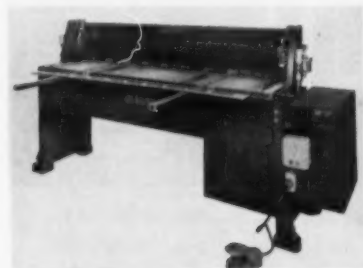
the required finish is obtained. Adequate lubrication is provided to the finishing stone by means of a built-in self-priming pump. Untrained workers can finish tool cutting edges without danger of spoiling the tool, damaging the stone or the machine. *Wickman Mfg. Co.*

For more data circle No. 51 on postcard, p. 109.



Power squaring shears

A re-designed power squaring shear is engineered to stall rather than break on overload. Silent herringbone gearing, electric clutch, centralized lubrication, triangulated



ram, and box type bed, are features of this all steel underdriven squaring shear. Capacity is 10 gage mild steel or stainless; cutting length, 73 in.; shearing speed, 80 spm. Air pressure required is 60-200 lb; motor, 5 hp, 1800 rpm. *Diamond Machine Tool Co.*

For more data circle No. 52 on postcard, p. 109.

Improved carbide

New Wessonmetal carbide is said to reduce need for separate grades, and promises a major advance in the utilization of carbide cutting tools in industry. The new metal, called Grade 26, is stated to be suitable for a wide range of machining operations on steels—formerly requiring 3 or 4 different carbide grades—and actually outperforms these various carbides in over 95 pct of all operations on which it has been tried to date. The carbide shows gains as high as 30 pct in tool life. In cutting steels at higher speeds it retains its edge hardness. *Wesson Metal Corp.*

For more data circle No. 53 on postcard, p. 109.



**useful
data
for you**



American's revised catalog 450
of Broaches, Broaching Machines
and Broaching applications

TABLE OF CONTENTS

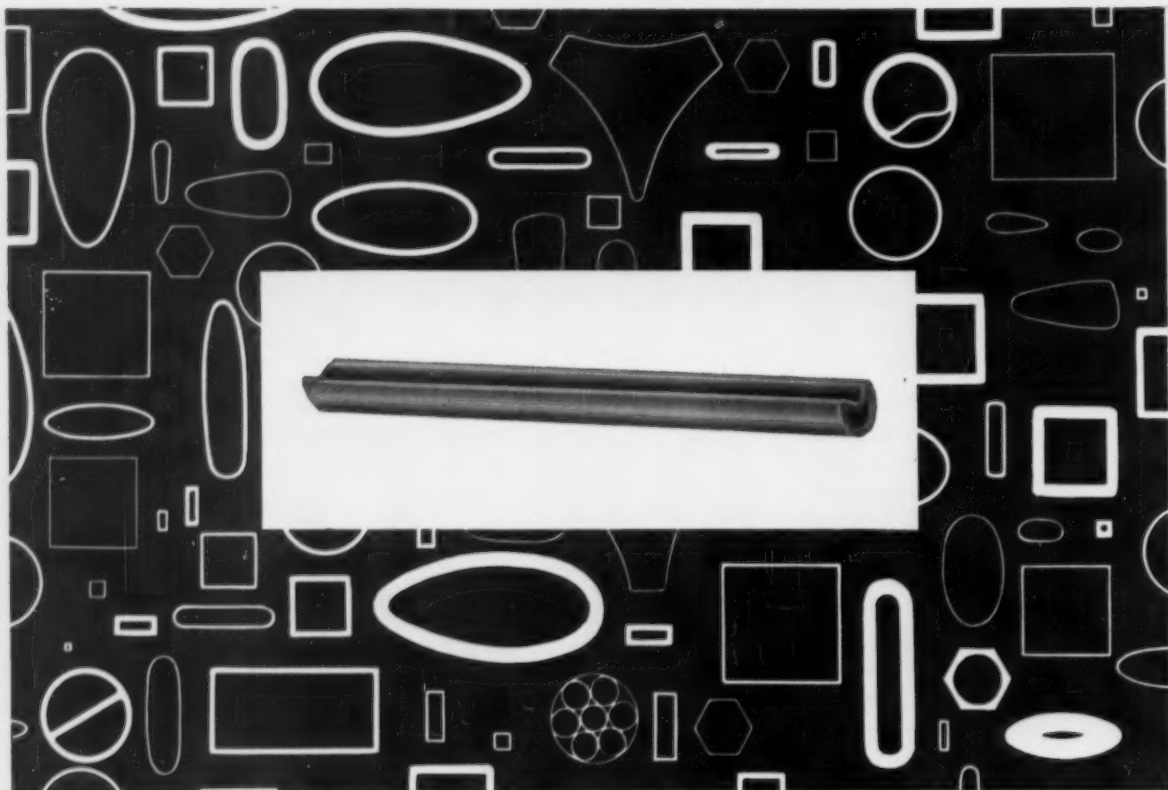
- Typical broaching applications
- Broach design data
- Typical broach sections
- Broach maintenance
- Broach pull head types
- Basic machine types
- Standard keyway broach chart



AMERICAN *American* BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery





A few of the shapes available from SUPERIOR in standard specifications and tolerances or to your own design. The tube in the foreground is a gun drill shank made from 4130 alloy steel.

Save time and money on special shaped tubing

"SUPERIOR" TUBING IS IMMEDIATELY AVAILABLE
IN A WIDE RANGE OF SHAPES, FORMS, ALLOYS

Many manufacturers have discovered that SUPERIOR's ability to supply as standard what many firms consider specialty tubing saves them trouble, time and money. SUPERIOR makes round, square, oval, rectangular, elliptical and flat oval tubing, for instance. It makes capillary tubing, pointer tubing, electronic tubing, telescopic sizes, large OD-light wall tubing. Over 55 analyses are available in carbon, alloy and stainless steels; in nickel and nickel alloys; in beryllium copper, titanium, zirconium.

The gun drill shank shown above and on the right is a good example of SUPERIOR's ability to supply unusual

shapes. This newly rediscovered method of producing close-tolerance high-finish holes demands straight, rigid, accurate shanks with a 110° V-groove. SUPERIOR can produce such a shape—and others—in a fraction of the time and cost it would take a customer to form his own.

If you're having difficulty getting the kind of tubing you want, SUPERIOR can undoubtedly help you. Write for your free copy of Bulletin 40—*A Guide to the Selection and Application of Superior Tubing*. SUPERIOR TUBE COMPANY, 2004 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif.

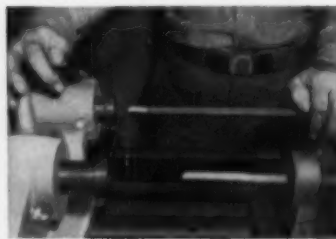
All analyses available in .010" to 1/8" OD; certain analyses in light walls up to 2 1/2" OD

Superior Tube

The big name in small tubing



Turks-head rollers converting a round section of SUPERIOR tubing into the typical elliptical shape for a Bourdon gage tube.



Gun drills can produce holes from 4 to 230 diameters or more in 4 times the speed of conventional drilling methods or better. Holes so produced are straight and round to tolerances of 0.0002" or less and wall finishes are 7 mu-in or better.

The Iron Age SUMMARY...

Warehouse demand points up steel shortage . . . Users worry about current needs . . . Automotive placing third quarter business.

Consumers Besiege Warehouses . . . Booming demand is generating a run on steel warehouse stocks. Desperate consumers are paying warehouse prices for fill-in tonnages to meet current requirements.

Meanwhile, automotive consumers are beginning to put on the pressure for third quarter. Their orders for some products for this period are beyond expectations. Demand for 1955 models is so good that at least one of the Big Three is postponing his switchover to new models rather than lose out on sales.

Warehouse buying by users that normally get what they need direct from the mills usually is the forerunner of (1) conversion deals, which are even more costly, and (2) gray market, where the price tag is what the traffic will bear. And where the sky's the limit.

It also means that some consumers—far from being able to build inventories—are barely able to get enough steel to keep their production lines operating.

No Surprise . . . The warehouse boom is not surprising. Mills are loaded to the hilt with orders. In flat-rolled, where the pinch has been on for weeks, producers have been struggling without too much luck to live up to delivery promises.

And it's the flat-rolled consumers that are leading the march on warehouses.

The warehouses themselves are having their problems. Overloaded with inventory several months ago, they are now pressing mills for deliveries. Their stocks of sheets, plates, and other products now look anemic on the basis of present and future demand this year.

Orders booked by producers in March ran well ahead of capacity, anywhere from 125 to 160 pct, depending on the mill. This means that April production will set an all-time record for the industry.

Carryovers a Factor . . . Mill backlogs are increasing rapidly. The consumer without orders on the books is running the risk of finding himself short later in the year. More and more mills now realize they will have to set aside three weeks to a month's production on tight products in order to bring deliveries in line with promises. Delivery delays are running 3-4 weeks behind.

Any consumer who is counting on a let-up in third quarter will be disappointed. (See page 52.) It's not in the cards. Carryovers plus continuing strong demand from virtually all industry will make for a strong market through third quarter and beyond.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week†	Last Week	Month Ago	Year Ago
Ingot Index (1947=49=100)	144.0	143.3	141.8	101.0
Operating Rates				
Chicago	99.0	98.5	99.0	80.0
Pittsburgh	98.0	98.0	95.0	73.0
Philadelphia	98.0	96.0	94.5	60.0
Valley	96.0	96.0	94.0	61.0
West	90.8	89.3	95.0	70.5
Detroit	94.0	93.0	90.0	73.0
Buffalo	105.0	105.0	100.0	67.5
Cleveland	101.5	99.3*	97.5	68.0
Birmingham	90.0	90.0	67.5	53.5
S. Ohio River	91.5	90.4*	87.0	77.0
Wheeling	96.0	94.0	95.0	93.0
St. Louis	106.1	90.0	80.0	55.5
Northeast	82.0	80.0*	94.0	50.0
Aggregate	96.0	95.5*	94.0	68.5

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (Gross ton)	\$56.59	\$56.59	\$56.59	\$56.59
Scrap, No. 1 hvy (gross ton)	\$36.00	\$37.33	\$37.50	\$25.67
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	21.50
Copper, electrolytic	36.00	36.00	33.00	30.00
Lead, St. Louis	14.80	14.80	14.80	13.80
Magnesium, ingot	29.25	29.25	27.75	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	92.125	...	90.875	96.25
Zinc, E. St. Louis	12.00	12.00	11.50	10.25

Warehouse Stock Gaps Widen

Mill competition shows up in warehouse gaps for many products . . . No relief expected until third quarter . . . Plates, structurals, sheets tightening up.

◆ **WAREHOUSES** are now in the thick of the competition at the mill and gaps are appearing in warehouse stocks for many products. No relief is in sight from hard-pressed mills until late in third quarter.

Significance of the run on the warehouses by large consumers is that warehouse prices are not inventory-building prices. This means that big consumers are not building up their inventories at this time and the tight situation that prevails for most products will continue that much longer.

For weeks after steel was tight at the mill level big consumers fought against paying warehouse prices. Now they are doing it without embarrassment as they fight to meet their production requirements.

Plates, structurals and sheets, particularly galvanized and cold-rolled, are all becoming tight at the warehouse level. Warehouses are beginning to complain that the mills are shorting them.

Typical of industry efforts to meet product requirements is the number of rolling mill production records being established by the mills. For instance: Republic Steel Corp.'s 98-in. continuous hot strip mill set an all-time record in March of 163,730 tons.

SHEETS AND STRIPS . . . In some centers, cold-rolled sheets are running 3 to 4 weeks behind on deliveries. Chicago district finds August and September solid on cold-rolled, taking into account that some mills are taking out July rollings as a means of becoming current. Hot-rolled is just as bad. In the East, one large producer is sold out through second quarter and is accepting third quarter business. Detroit reports galvanized and cold-rolled sheet sold out for sec-

ond quarter with some mills opening their books for third quarter orders.

GALVANIZED . . . With construction booming along at a record clip, demand for galvanized sheets continues strong. First half tonnages have been spoken for, and the product looks solid for third quarter and probably for the balance of the year.

ELECTRICAL SHEETS . . . No sign of abatement in heavy demand, which is coming from stepped-up requirements from the electrical industry. This industry, in turn, is busy meeting requirements for appliances (fractional hp motors) and demand for heavy electrical equipment and transformers.

BARS . . . Strong demand from automotive, farm equipment, and other industries has moved out bar deliveries to 8-9 weeks in the Midwest. Indications are that consumers will be placing orders 9-10 weeks ahead before long.

PLATES . . . Deliveries are lengthening. Warehouse demand is building up. In Detroit, tool and die makers are in the market strong; commercial tank builders are also adding their bit to the general upswing. Demand for

electricweld linepipe purposes continues. Railroads are also in the market. In the East, one producer is now accepting July tonnage orders on sheared plate. Orders for universal plate are being accepted for May.

STRUCTURALS AND SHAPES . . . Bookings are strong through the third quarter in Chicago. Wide-flange beams are in heavy demand, with late July or August delivery being quoted. May and June are filling up for an Eastern producer.

WIRE PRODUCTS . . . Detroit reports automotive consumers have entered the market for third quarter requirements, and market sources indicate they are sizable. Farm demand is on in full swing. Some merchant wire producers are running at rated capacity or above, and expect business to remain solid for balance of the year. Merchant product inventories at mill level are spotty, practically exhausted in some grades with some producers. Construction wire demand is keeping pace with building boom.

PIPE AND TUBING . . . Seamless pipe capacity is sold out through June in Pittsburgh. Third quarter orders are on the increase with oil country demand leading the way. Weld is booked through April and May order books are filling rapidly. In the East, one producer's order books are filling for April on all sizes of pipe.

WAREHOUSE . . . Volume is just about double normal. Prosperity appears to have hit the warehouses with heavy impact. Distributors are receiving business from normal mill customers as well as the old standbys. Just about all products are moving at a good clip. A universal complaint is that deliveries from mills are slowing. Demand for plates and structurals is strong.

GENERAL . . . Southern Pacific Co., Houston, has placed an order with Pullman Standard Car Manufacturing Co.'s Butler, Pa., plant for 350 covered hopper cars. Cost is estimated at over \$3 million for the all-welded steel design rolling stock. The cars will be used for shipping cement, soda ash, industrial sand and various other bulk commodities.

Chicago Bridge & Iron Co. reports a new method for cladding metals developed at its Birmingham, Ala., plant after more than 5 years of research. New facilities have been constructed for production of the product known as Hortonclad.

Purchasing Agent's Checklist

ALUMINUM: Squeeze is on supply. No pickup soon . . . p. 47

STEEL: New stainless market created in bulk milk shipping uses . . . p. 50

MICROFILM: Industry develops new uses. Savings estimated at \$140 million a year . . . p. 54

MACHINE TOOLS: Users placing more emphasis on performance, but style is still important . . . p. 75

Comparison of Prices

(Effective Apr. 19, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Apr. 19 1955	Apr. 12 1955	Mar. 22 1955	Apr. 20 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Galvanized strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.225	4.225	4.225	4.10
Plates wrought iron	9.30	9.30	9.30	9.30
Stain's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.65	\$9.65	\$9.65	\$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.63
Special coated mfg. ternes	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.20
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Nails: (per 100 lb.)				
Heavy nails	\$4.45	\$4.45	\$4.45	\$4.325
Light nails	5.55	5.55	5.55	5.20
Semi-finished Steel: (per net ton)				
Re-rolling billets	\$64.00	\$64.00	\$64.00	\$62.50
Slabs, re-rolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00
Wire Rod and Skeip: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skeip	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.797¢	4.797¢	4.797¢	4.634¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Apr. 19 1955	Apr. 12 1955	Mar. 22 1955	Apr. 20 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$61.19	\$61.19	\$61.19	\$61.19
Foundry, Valley	54.50	54.50	54.50	54.50
Foundry, Southern, C.R.	50.45	50.45	50.45	50.45
Foundry, Birmingham	53.55	53.55	53.55	53.55
Foundry, Chicago	55.50	55.50	55.50	55.50
Basic, del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Malleable, Chicago	56.50	56.50	56.50	56.50
Malleable, Valley	56.50	56.50	56.50	56.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢
2 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	\$56.59	\$56.59	\$56.59	\$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$35.50	\$38.50	\$38.50	\$26.50
No. 1 steel, Phila. area	37.00	37.00	38.50	21.50
No. 1 steel, Chicago	35.50	36.50	35.50	29.00
No. 1 bundles, Detroit	29.00	29.00	29.00	18.00
Low phos., Youngstown	39.50	39.50	37.50	31.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	43.50	42.50
No. 1 mach'y cast, Phila'del'a.	44.50	44.50	44.50	39.50
No. 1 mach'y cast, Chicago	47.00	48.00	46.50	39.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$36.00	\$37.33	\$37.50	\$25.67
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$13.00	\$13.00	\$14.58	\$14.38
Foundry coke, prompt	16.75	16.75	16.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	36.50	36.00	35.00	30.00
Copper, Lake, Conn.	36.50	36.00	33.00	36.00
Tin, Straits, New York	\$2.125	91.125*	90.875	96.25
Zinc, East St. Louis	12.00	12.00	11.50	10.25
Lead, St. Louis	14.80	14.80	14.80	13.80
Aluminum, virgin ingot	23.20	23.20	23.20	21.50
Nickel, electrolytic	67.67	67.67	67.67	68.68
Magnesium, ingot	29.25	29.25	27.75	27.75
Antimony, Laredo, Tex.	28.50	28.50	28.50	28.50

* Tentative. † Average. * Revised.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on P. 154 →

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem B1	58.00	58.50	59.00	59.50	
Birmingham R3	52.38	52.88			
Birmingham W9	52.38	52.88			
Birmingham U4	52.38	52.88	56.50		
Buffalo R3	56.00	56.50	57.00		
Buffalo I11	56.00	56.50	57.00		
Buffalo W9	56.00	56.50	57.00		
Chicago J4	56.00	56.50	56.50	57.00	
Cleveland A5	56.00	56.50	56.50	57.00	61.00
Cleveland R3	56.00	56.50	56.50		
Darlington L3	52.50	52.50	52.50		
Dubuq H	56.00	56.50	56.50	57.00	
Erie I4	56.00	56.50	56.50	57.00	
Everett A6	62.00	61.00	61.50		
Fontana K1	62.00	62.50			
Genese, Utah C7	56.00	56.50			
Granite City G2	57.90	58.40	58.90		
Hubbard Y1			56.50		
Minnequa C6	58.00	59.00	59.00		
Monessen P6	56.00				
Neville Isl. P4	56.00	56.50	56.50		
N. Tonawanda T1	56.00	56.50	57.00		
Pittsburgh U1	56.00	56.50	57.00		
Sharpsville S3	56.00	56.50	56.50	57.00	
Se. Chicago R3	56.00		56.50		
Steelton B3	58.00	58.50	59.00	59.50	64.00
Swedeland A2	56.00	56.50	56.50	59.50	
Toledo I4	56.00	56.50	56.50	57.00	
Troy, N. Y. R3	58.00	58.50	59.00	59.50	64.00
Youngstown Y1			56.50	57.00	

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.50 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, 32¢ per ton for 0.5 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, H1, \$46.25; Jackson, J1, G1, \$45.00. Add \$1.00 per ton for each 0.50 pct silicon over base (0.01 to 0.50 pct) up to 17 pct. Add \$1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Reassess ferrallite prices are \$1 over comparable silvery iron.

Product	301	302	303	304	316	321	307 Cb	410	416	430
Ingot, re-rolling	16.75	17.75	19.25	19.00	29.75	23.50	35.50	14.00	—	14.25
Slabs, billets, re-rolling	21.00	23.25	25.25	24.50	38.00	30.25	66.75	18.25	—	18.5
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.75	48.25	—	31.00	31.75	31.7
Billets, forging	30.00	30.25	32.75	31.75	48.25	36.00	54.75	24.00	24.50	24.5
Bars, wires, structurals	35.75	36.00	38.75	38.00	57.25	47.75	64.25	28.75	29.25	29.2
Plates	37.75	38.00	40.25	40.50	60.50	48.50	69.25	30.00	30.50	30.5
Sheets	41.75	42.00	49.25	44.50	64.50	51.25	77.50	34.25	41.25	34.7
Strip, hot-rolled	30.25	32.50	37.25	35.00	55.00	40.75	63.00	26.25	—	27.8
Strip, cold-rolled	38.75	42.00	49.00	44.50	64.50	51.25	77.50	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J3; Baltimore, Md., J1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U3; New Castle, Ind., J2; Ft. Wayne, Ind., Philadelphia, D5.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C1; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, Mich., M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb. higher) W1 (25¢ per lb. higher); New Bedford, Mass., R6.

Bar: Baltimore, Md., J1; Duquesne, Pa., U1; Marshall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ill., C1; Canton, O., T5; Ft. Wayne, Ind., Philadelphia, D5.

Wire: Waukegan, Ill., C1; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., Harrison, N. J., D3; Baltimore, Md., J1; Dunkirk, N. Y., A3; Monessen, Pa., U1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, Md., A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, Ill., U1; Marshall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Cantonville, Pa., C15; Philadelphia, D5.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, Md., A7; Washington, Pa., J2; McKeesport, Pa., F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.

Price Action Stirs Market

Pittsburgh price drops sharply on purchase by major steel producer . . . Other areas report weakness . . . Booming steel output makes price losses puzzling.

◆ ON THE strength of a purchase by a major Pittsburgh producer, the price of No. 1 heavy melting steel in that area dropped to \$36 on the top end. Other grades shared in this weakness and scrap people in other major centers were talking about this surprising move.

With Washington giving the go ahead on scrap exports and steel outputs continue to boom, price weakness is puzzling and it would not be surprising if the market reversed itself in the next week or two.

Reflecting the Pittsburgh drop THE IRON AGE Heavy Melting Steel Scrap Composite dropped to \$36.00.

Chicago Mercantile Exchange has changed contracts governing trading in scrap steel futures. Under the new rules, effective Apr. 18, the amount of the contract changes from 40 gross tons to 160 gross tons. Delivery of a contract will be made in 4 gondola cars. Delivery dates for the new contracts will be October 1955 and January 1956. Other changes cover definitions of different grades and price differentials on mixed shipments.

Institute of Scrap Iron & Steel is considering means of setting and enforcing higher standards for No. 2 bundles. Institute officials point to the emergence of No. 2 bundles as the leading scrap yard product and say the future of the industry depends on acceptance of this grade.

Pittsburgh . . . A purchase of open-hearth scrap by a large consumer last week has caused a general weakening of the market with nearly every grade showing lower prices. Openhearth grades were particularly affected with

No. 1 heavy melting down sharply to \$36 and No. 2 heavy melting and No. 2 bundles off \$2 a ton. Railroad scrap prices further reflected the market with drops from 50¢ to \$1 necessary to conform with latest railroad lists. Some blast furnace grades were also weaker on the basis of broker activity. However, there were very few actual sales at the lower prices and brokers were considering offering mixed borings and machine shop turnings at still lower prices.

Chicago . . . The reported eastern scrap break, followed immediately by a flurry of mill offers at reduced prices, pushed Chicago scrap prices back by at least \$1 last week, with some scrap reported moving at the bottom of the new spread. Adding to the gloom were reported offers from dealers who have been supplying material to the East for water shipment to brokers in this area. At the same time, broker price offers to dealers skidded as brokers put on the brakes, waited to see at what point the market would level off. With an advancing operating rate there is no strong reason for a major market break, and with pressure for second quarter steel still undiminished at the mill level, a number of dealers were, at press time, still holding their price levels and were turning down a scattering of broker offers at very low prices. The Chicago shoveling turnings price was incorrectly printed as \$21-22 last week. Correct price was \$20-21.

Philadelphia . . . The market continues to hold steady. No. 1 heavy melting remains at \$37.50 tops. Some small quantity buying by one district mill is reported by dealers at \$1 under current No. 1 and No. 2 heavy melting prices. On the basis of latest sales reported by a major broker, price of No. 2 bundles is down \$2 to a top of \$28.00. Most consumers are out of the buying picture at present.

Cleveland . . . Cleveland mills still have substantial inventories and major portion of buying remains in blast furnace grades and malleable for foundries. Under market offerings are also prevalent.

Detroit . . . The F.O.B. price of No. 2 bundles dropped \$2 this week when a Pittsburgh mill made a buy. Local buying is at a standstill and the market is soft. Dealers and brokers explain it this way: Mills have big scrap inventories and are only buying quality scrap. High auto production has increased the amount of premium tonnages and lower grades can't be moved unless the price is reduced. Most sources expect the new automotive lists, which will be out in about 10 days, to be down 50¢ to \$1. Price of low phos quoted at \$30-\$31 on basis of broker offerings.

New York . . . Scrap market in New York showed export holding strong and no new significant domestic buying. Brokers have covered last month's mill orders and are waiting for producers to come in the market again.

Birmingham . . . Although more scrap is coming into dealers' yards, there is still a short supply of No. 2 heavy melting.

St. Louis . . . The steel rate jumped 16 points to 106.1, the highest it has been since July of 1953. The flow of scrap iron continues steady and is equal to the melt, which is all that interests the mills.

Cincinnati . . . Market was growing weaker in absence of major sales at any price. Dealers were hustling shipments on old orders in anticipation of a price break.

Boston . . . Lagging scrap activity in the face of heavy steel production continues to mystify Boston scrap people. Chemical borings dropped \$1 and are almost in a class with unstripped motor blocks as a nominal price item.

Buffalo . . . Scrap market in this area continues to mark time with shipments going out on orders. A wildcat railroad strike curtailed production of one large mill over the weekend.

West Coast . . . Prices holding firm at San Francisco, Los Angeles and Seattle. Export activity continues at a fairly brisk rate.



they found *\$27,000 in a puddle of oil...

It was easy enough to find a puddle of oil in this New England steel plant. 700 gallons of the expensive stuff ended up on the floor every week. It was wasted in the lubrication of massive bearings on their strip rolling mill. Housekeeping problems were terrific.

Then Alemite Oil-Mist was installed on one set of bearings for a test. The results were so immediate—so impressive, that this remarkable system was installed throughout the plant. It eliminated oil waste completely! Saved the 700 gallons of oil that had ended up on the floor every week—a matter of \$27,000 a year!

Even more important were the savings effected in labor costs, downtime, and the reduced possibility of bearing failure. A major housekeeping problem and fire hazard was eliminated from the plant. No wonder management is delighted. Delighted, too, with the ease of Oil-Mist installation and the modest cost, repaid by savings in a few short weeks.

Here's the unit that brings these savings to any machine! This is the heart of the Alemite Oil-Mist system. It atomizes oil into tiny, airborne particles that are distributed to bearings through tubing. These particles form a continuous, uniform film of oil that both lubricates and cools the bearing surfaces.



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Three types of fittings allow the use of Alemite Oil-Mist on any bearing — any machine!



1. Oil-Mist fittings bring the most efficient lubrication in the world to roller, ball, needle—or any anti-friction type of bearing.



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3. Oil-Mist Condensing fittings are applied to plain bearings, slides, ways, vees, cams, and rollers. Completely condense Oil-Mist.

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Name

Company

Address

City Zone State

Scrap Prices (Effective Apr. 19, 1955)

Pittsburgh

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and ms. turns.	21.00 to 22.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. punch'g. plate	40.00 to 41.00
Heavy turnings	33.00 to 34.00
No. 1 RR. hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	45.00 to 46.00
Rails 2 ft. and under	50.00 to 51.00
RR. steel wheels	44.50 to 45.50
RR. spring steel	44.50 to 45.50
RR. couplers and knuckles	44.50 to 45.50
No. 1 machinery cast.	43.00 to 44.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	34.00 to 35.00

Chicago

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 factory bundles	35.00 to 36.00
No. 1 dealers' bundles	35.00 to 36.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	41.00 to 42.00
Low phos. punch'g. plate	38.00 to 39.00
Low phos. 3 ft. and under	37.00 to 38.00
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	42.00 to 43.00
Retorling rails	52.00 to 53.00
Rails 2 ft. and under	50.00 to 51.00
Locomotive tires, cut	37.00 to 38.00
Cut bolsters & side frames	38.00 to 40.00
Angles and splice bars	44.00 to 45.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	40.00 to 41.00
No. 1 machinery cast.	46.00 to 48.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	33.00 to 35.00
Cast iron brake shoes	34.00 to 35.00
Cast iron car wheels	37.00 to 38.00
Malleable	45.00 to 46.00
Stove plate	36.00 to 37.00

Philadelphia Area

No. 1 hvy. melting	\$36.50 to \$37.50
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	36.50 to 37.50
No. 2 bundles	27.00 to 28.00
Machine shop turn.	21.50 to 22.50
Mixed bor. short turn.	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Clean cast chem. borings	28.00 to 29.00
Low phos. 5 ft. and under	40.00 to 41.00
Low phos. 3 ft. and under	41.00 to 42.00
Low phos. punch'g.	41.00 to 42.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	34.00 to 35.00
RR. steel wheels	41.50 to 42.50
RR. spring steel	41.50 to 42.50
Rails 18 in. and under	51.00 to 52.00
Cupola cast.	36.00 to 38.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	44.00 to 45.00
Malleable	44.00 to 45.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	44.00 to 45.00
Charging box cast.	37.00 to 38.00

Cleveland

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Cut struct'l & plates, 2 ft. & under	41.00 to 42.00
Drop forge flashings	35.00 to 36.00
Low phos. punch'g. plate	37.00 to 38.00
Foundry steel, 3 ft. & under	40.50 to 41.50
No. 1 RR. heavy melting	36.00 to 37.00
Rails 3 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	43.00 to 44.00
Malleable	45.00 to 46.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. plate	39.00 to 40.00

Buffalo

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 busheling	31.00 to 32.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft. and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	41.00 to 42.00
No. 1 cupola cast.	36.00 to 37.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$28.50 to \$29.50
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles, openhearth	28.50 to 29.50
No. 2 bundles	19.00 to 20.00
New busheling	28.00 to 29.00
Drop forge flashings	27.00 to 28.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.50 to 16.50
Shoveling turnings	16.50 to 17.50
Cast iron borings	16.50 to 17.50
Low phos. punch'g. plate	32.00 to 33.00
No. 1 cupola cast.	36.00 to 38.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	32.00 to 33.00
Automotive cast.	40.00 to 42.50

St. Louis

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	24.50 to 25.50
Machine shop turn.	16.00 to 17.00
Cast iron borings	17.50 to 18.50
Shoveling turnings	17.50 to 18.50
No. 1 RR. hvy. melting	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Locomotive, tires uncut	36.50 to 37.50
Angles and splice bars	36.50 to 37.50
Std. steel car axles	36.00 to 37.00
RR. spring steel	37.00 to 38.00
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	34.00 to 35.00
Cast iron brake shoes	32.00 to 33.00
Stove plate	35.00 to 36.00
Cast iron car wheels	36.00 to 37.00
Malleable	36.00 to 37.00
Unstripped motor blocks	33.50 to 34.50

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 bundles	26.00 to 27.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	26.00 to 27.00
Elec. furnace, 3 ft. & under	31.00 to 32.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and short turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Clean cast chem. borings	16.00 to 17.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	27.00 to 28.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$32.50
No. 2 hvy. melting	25.50
No. 2 bundles	\$24.00 to 25.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Clean cast chem. borings	22.00 to 23.00
No. 1 machinery cast.	37.00 to 39.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	31.00 to 32.00
Heavy breakable cast.	31.00 to 32.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	32.00 to 33.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR. hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	39.00 to 40.00
Rails, 18 in. and under	44.00 to 45.00
Angles & splice bars	40.00 to 41.00
Retorling rails	43.00 to 44.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	25.50 to 26.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos., 18 in. & under	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

San Francisco

No. 1 hvy. melting	\$27.00
No. 2 hvy. melting	25.00
No. 1 bundles	26.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn.	8.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	27.00
No. 1 cupola cast.	40.00

Los Angeles

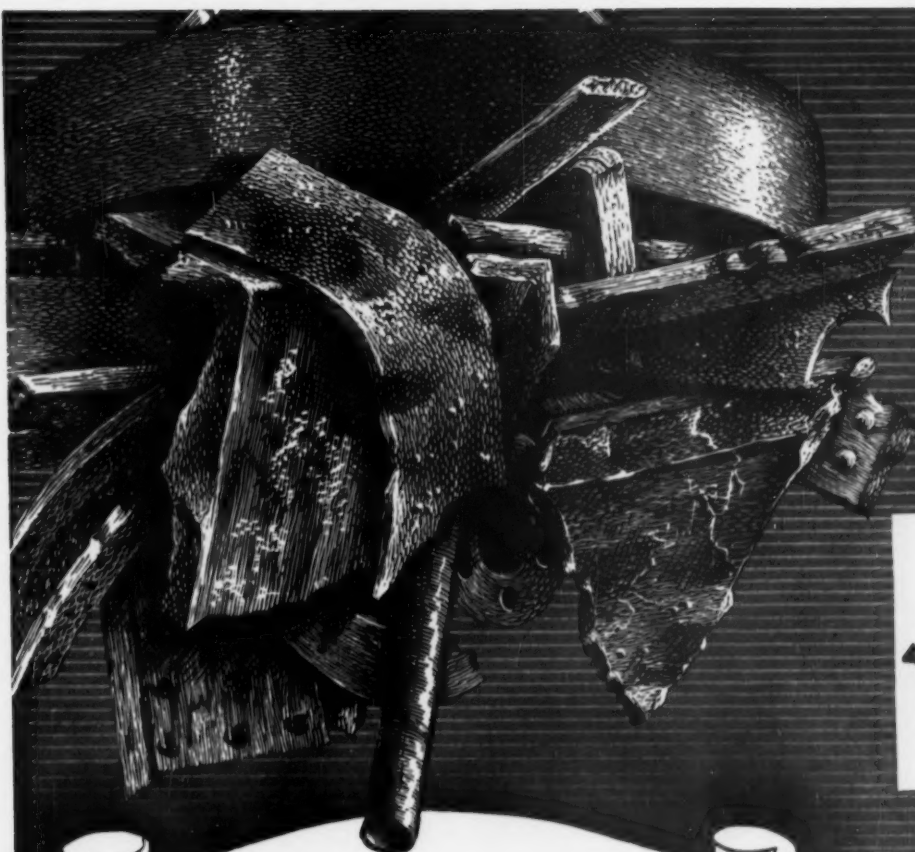
No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	20.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under	30.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	\$41.00 to 42.00

Seattle

No. 1 hvy. melting	\$33.00
No. 2 hvy. melting	29.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under	30.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	\$41.00 to 42.00

Hamilton, Ont.

No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Bushellings	29.00
Bush., new fact prep'd	32.00
Bush., new fact unprep'd	28.00
Short steel turnings	\$16.00 to 17.00
Mixed bor. and turn.	16.00 to 17.00
Rails, rerolling	43.00
Cast scrap	42.00 to 45.00



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Snag in U.K. Copper Release

Britain tries releasing 45,000 tons of copper from government stockpile to ease shortage, lower prices . . . But move is seen as being too little and coming too late.

♦ IT'S A LITTLE too little and a little too late, but Britain's action last week in releasing 45,000 tons of electrolytic copper from government stocks was at least a step in the right direction.

Idea behind the move, of course, was to help ease the copper shortage and to deflate the fantastic price copper has been commanding on the London Metal Exchange.

The 45,000 tons of copper being made available by the British Board of Trade comes from stocks that were left in government hands after private trading was restored in 1953. It was reported that about 27,000 tons were sold to the Rhodesian producers.

Ways of disposing of the rest of the copper were being discussed late last week.

But many industry people both here and in England were of the opinion that the move should have been made 2 or 3 months ago, before the copper price went out of sight on the London Metal Exchange. Also, it is believed the release of the 45,000 tons of copper won't really affect the market very much since distribution is to be spaced out over the rest of the year. Impact would have been much greater had disposal been concentrated in a 3-month period, trade sources believe.

That the British Board of Trade's action may not really prove too effective is indicated by the

gyrations of copper on the London Metal Exchange last week. When the announcement was made price of spot copper plunged nearly 4¢ per lb to 38¢ per lb. This left the price only 2¢ above the U. S. level. By the end of the week however, copper rebounded vigorously to 40.37¢ per lb.

COPPER . . . Immediate effect of Britain's move in releasing 45,000 tons of copper was to cause a 1.5¢ per lb decrease in scrap prices here. No. 2 heavy copper and wire was being purchased at 31.50¢ per lb shortly after the news was released. But as a result of the strong resurgence of the London price at the end of the week, copper scrap here bounded back ½¢ to 32¢ per lb.

It was rumored that Chile, displeased over developments in England, was considering diverting its copper sales from the United Kingdom to the U. S., Far East, Latin-American markets. This, however, could not happen because Chile is already sold out on refined copper through the third quarter. It also seems highly unlikely that Chile would prefer to sell at the 36¢ per lb U. S. price rather than at the higher London price.

Strong demand for copper shows up statistically in figures put out by the Copper Institute. In March deliveries to domestic consumers increased 22,000 tons over the previous month, totaling 130,586 tons. And crude and refinery production also gained. Crude output hit 98,908 tons in March, up around 9,900 tons from the previous month. Domestic production of re-

fined copper last month amounted to 134,933 tons, 11,800 tons more than in February.

There was little change with respect to stocks as March figures show refiners with a total of 46,091 tons of copper, about 1500 tons more than in the previous month.

TIN . . . As was anticipated by most in the trade, the Senate committee studying the problem of whether or not to continue operation of the Texas City tin smelter recommended that it be kept running until June 30, 1956. After that date it was suggested the smelter be sold or leased to a private company.

Now the proposal must be voted on in Congress and the problem of what to do with the tin produced at the smelter—stockpile it or make it available to industry—must be clarified.

ALUMINUM . . . Commerce Dept. last week issued regulations on second quarter exports of aluminum scrap and remelt ingots.

Exporters now must present statements of their shipments of scrap and remelt ingots in the four quarters ended Mar. 31, if quantities shipped under each Schedule B number had a total value of \$2,000 or more for the period.

If exporters who shipped scrap or ingots in the base period want to share in the second-quarter quota, set at 9,000 short tons, they must submit their statements by Apr. 26. A small part of the quota will be set aside for applicants with no record of participation in the base period.

License applications to export new and old scrap (B No. 630050) and remelt ingots (B No. 630070) must be filed before June 7 to be considered for current-quarter licensing. Applications now on file at the Bureau of Foreign Commerce, U. S. Commerce Dept. will be returned to senders for resubmission in keeping with the new rules.

Contract has been awarded for most of the construction work on Kaiser's sheet and foil mill which will be erected near Ravenswood, W. Va. Work is scheduled to begin on May 1 for completion at the end of this year.

(For a special report on the aluminum market see p. 47).

MAGNESIUM . . . Magnesium casting shipments in the short month of February fell off about 6 pct from January, totaling 1080 tons. This was 2 pct below the year ago total.

Permanent mold shipments were the only category able to register an increase over the previous month, totaling 243 tons.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Apr. 13	Apr. 14	Apr. 15	Apr. 16	Apr. 18	Apr. 19
Copper, electro, Conn.	36.00	36.00	36.00	36.00	36.00	36.00
Copper, Lake, delivered	36.00	36.00	36.00	36.00	36.00	36.00
Tin, Straits, New York	91.25	91.375	91.75	...	92.125	92.125*
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	14.80	14.80	12.00	14.80	14.80	14.80

Note: Quotations are going prices

*Tentative



COPPER DETERMINATION

Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical **CONTROL**
for the production of low alloy steel and gray iron

Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, ALLOYMET 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

For further information, write us for our booklet, "Master Alloys."

*Nominal Chemical Composition



ALTER

Alloy Metal Division

C O M P A N Y

1701 Rockingham Road, DAVENPORT, IOWA

Phone 6-2561

Teletype DV 588

Nonferrous Prices (Effective Apr. 19, 1955)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet		Plate	
	0.032 in.	0.061 in.	0.126 in.	0.250 in.
1100, 3003	39.1	37.1	35.9	35.5
3004	44.0	39.8	38.1	37.6
5052	46.7	41.9	40.2	39.3
5024-O, -OAL	49.4	40.8	39.3	39.4
7075-O, -OAL	60.8	49.1	45.8	46.8

Extruded Solid Shapes: Shape factors 1 to 5, 88.7¢ to 86.7¢; 12 to 14, 39.4¢ to 1.04¢; 14 to 26, 42.2¢ to 1.35¢; 26 to 38, 49.8¢ to 1.97¢.
Rod, Round: Rolled, 1.064-4.5 in. 1100-F, 68.6¢ to 40.1¢; cold finished, 0.375-3.49 in., 1100-F, 47.9¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T3, 1/4-11/32 in., 63.5¢ to 50.1¢; 1/2-1 1/2 in., 49.9¢ to 46.9¢; 1 9/16-3 in., 46.7¢ to 42.7¢. Base 3000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 1100, 47.1¢ to 35.5¢; 5052, 50.7¢ to 44.4¢; 2017-T4, 64.3¢ to 44.7¢; 5051-T4, 59.5¢ to 44.1¢.

Extruded Tubing: Rounds, 5052-T6, OD 1/4-2 in., 44.6¢ to 64.8¢; 2-4 in., 40.3¢ to 64.6¢; 4-6 in., 40.8¢ to 49.8¢; 6-9 in., 41.4¢ to 62.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42% x 60-in., \$2.998; x 96-in., \$4.801; x 120-in., \$6.002; x 144-in., \$7.302. Coiled sheet, per lb, 6.019 in. x 28 in., 30.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: F81-O 1/4 in., 50¢; 3/16 in., 60¢; 1/2 in., 50¢; 0.064 in., 76¢; 0.032 in., 97¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 79¢; 1/2 to 1 in., 62.5¢; 1 1/4 to 1.749 in., 59¢; 2 1/4 to 3 in., 54.5¢. Other alloys higher. Base up to 1 in. diam, 10,000 lb; 1 1/4 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M, in weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 67.3¢; 0.22 to 0.25 lb, 5.9 in., 64.3¢; 0.50 to 0.59 lb, 8.6 in., 61.7¢; 1.8 to 2.59 lb, 10.5 in., 59.8¢; 4 to 6 lb, 28 in., 55¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.50 lb, 20,000 lb; 1.50 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD 1/4 to 5/16 in., \$1.46; 1/2 to 1 in., \$1.32; 1 1/4 to 1 in., 99¢; 1 to 2 in., 82¢; 0.166 to 0.219 in. wall: OD, 1/4 to 1 in., 67¢; 1 to 2 in., 63¢; 3 to 4 in., 62¢. Other alloys higher. Base, OD: Up to 1 1/4 in., 10,000 lb; 1 1/4 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$9; Forgings, \$9.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel Monel		Inconel
	Sheet, CR	Strip, CR	
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	122	108	153
Shot, Blocks	85		

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet		Rods	Extruded Shapes
	52.79	51.11		
Copper	52.79	51.11		54.86
Copper, h-r	64.76	51.11		
Copper, drawn		52.36		
Low brass	49.75	49.69		
Yellow brass	46.27	46.21		
Red brass	50.99	50.93		
Naval brass		44.30		45.64
Leaded brass				43.09
Com. bronze	52.78	52.72		
Mang. bronze	53.73	47.83		49.39
Phos. bronze	73.03	73.53		
Muntz metal	48.14	42.95		45.20
NI silver, 10 pct	60.20	62.28		66.34
Beryllium copper, CR, 1.9% Be, Base				
2000 lb, f.o.b.				
Strip				\$1.74
Rod, bar, wire				1.71

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	23.20
Aluminum pig	21.50
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb cont'd Be, \$40.00	
per lb contained Be	\$71.50
Bismuth, ton lots	\$2.25
Cadmium, del'd	\$1.70
Cobalt, 97-99% (per lb)	\$2.60 to \$2.67
Copper, electro, Conn. Valley	36.00
Copper, Lake, delivered	36.00
Gold, U. S. Treas., per troy oz.	\$35.00
Iridium, 99.9%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$120
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	28.50
Ingot	29.25
Magnesium, sticks, 100 to 500 lb	49.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$317 to \$320
Nickel electro, f.o.b. N. Y. warehouse	67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	\$18 to \$20
Platinum, dollars per troy oz.	\$75 to \$78
Silver, New York, cents per troy oz.	87.00
Tin, New York	92.125
Titanium, sponge, grade A-1	\$2.95
Zinc, East St. Louis	12.00
Zinc, New York	12.50
Zirconium copper, 50 pct	\$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	37.00
No. 120	36.50
No. 123	36.00
80-10-10 ingot	
No. 305	41.00
No. 315	38.75
88-10-2 ingot	
No. 210	50.75
No. 215	47.25
No. 245	42.25
Yellow ingot	
No. 405	32.25
Manganese bronze	
No. 421	34.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	31.00-32.00
0.60 copper, max.	30.75-31.75
Piston alloys (No. 122 type)	29.00-30.00
No. 12 alum (No. 2 grade)	28.50-29.50
108 alloy	29.00-30.00
195 alloy	30.00-31.50
13 alloy (0.60 copper max.)	30.75-31.75
ASX-679	29.00-30.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—85-97 1/2%	30.50-31.50
Grade 2—92-95%	30.00-30.50
Grade 3—90-92%	29.00-29.50
Grade 4—85-90%	28.00-28.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.92
Electrodeposited	39.78
Brass, 80-20	45.42
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	90.50*
Cadmium	\$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulphate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	31.35*
Nickel chloride, 300 to 400 lb.	43.50*
Silver cyanide, 100 oz. lots, per oz.	75 1/4
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	\$4.30

*Effective Jan. 3.

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	32	31 1/4
Yellow brass	23 1/2	22
Red brass	28 1/2	27 1/2
Comm. bronze	22 1/2	21 1/2
Mang. bronze	22 1/6	21
Yellow brass rod ends	23 1/2	22

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	33
No. 2 copper wire	31 1/2
Light copper	29 1/2
*Refinery brass	30

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	32 1/2—33
No. 2 copper wire	31—31 1/2
Light copper	29 1/2—29 3/4
No. 1 composition	27
No. 1 comp. turnings	26 1/2
Roller brass	20 1/2
Brass pipe	20
Radiators	21

Aluminum

Mixed old cast.	18—19
Mixed new clips	18—20
Mixed turnings, dry	17 1/2—19

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	30—30 1/2
No. 2 heavy copper and wire	28 1/2—29
Light copper	27—27 1/2
New type shell cuttings	26 1/2—27
Auto radiators (unswayed)	19—19 1/2
No. 1 composition	25—25 1/2
No. 1 composition turnings	24—24 1/2
Unlined red car boxes	19—19 1/2
Cocks and faucets	21—21 1/2
Mixed heavy yellow brass	17 1/2—18
Old rolled brass	18—18 1/2
Brass pipe	21—21 1/2
New soft brass clippings	21 1/2—22
Brass rod ends	20—20 1/2
No. 1 brass rod turnings	19 1/2—20

Aluminum

Alum. pistons and struts	11 1/2—12 1/2
Aluminum crankcases	15 1/2—16
1100 (28) aluminum clippings	18—18 1/2
Old sheet and utensils	15 1/2—16
Borings and turnings	9 1/2—10
Misc. cast aluminum	14 1/2—15
2024 (24a) clippings	15—15 1/2

Zinc

New zinc clippings	6—6 1/2
Old zinc	4 1/2—5
Zinc routings	3 1/4—3 1/2
Old die cast scrap	3 1/4—3 1/2

Nickel and Monel

Pure nickel clippings	57
Clean nickel turnings	40
Nickel anodes	57
Nickel rod ends	57
New Monel clippings	28
Clean Monel turnings	21
Old sheet Monel	26
Nickel silver clippings, mixed	16 1/2
Nickel silver turnings, mixed	13 1/2

Lead

Soft scrap lead	11 1/2—11 1/4
Battery plates (dry)	6 1/2—6 1/4
Batteries, acid free	4 1/2

Magnesium

Segregated solids	18 1/2—19
Castings	17 1/2—18

Miscellaneous

Block tin	75
No. 1 pewter	52
No. 1 auto babbitt	48
Mixed common babbitt	14
Solder joints	17—17 1/2
Siphon tops	40
Small foundry type	15 1/2—16
Monotype	14 1/2—15
Lino. and stereotype	14—14 1/2
Electrotype	12—12 1/2
Hand picked type shells	9 1/2—10
Lino. and stereo, dross	6 1/2
Electro dross	5

IRON AGE		Notes identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES (Effective Apr. 19, 1955)		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled
EAST	Bethlehem, Pa.			\$86.00 B3		4.30 B3	6.45 B3	4.30 B3						
	Buffalo, N. Y.	\$64.00 B3	\$78.00 B3, R3	\$86.00 B3, R3	5.075 B3	4.30 B3	6.45 B3	4.30 B3	4.05 B3, R3	5.75 R7, S10	6.15 B3	8.425 B3		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.10 A2	5.80 A2	6.15 A2			
	New Bedford, Mass.									6.20 R6				
	Johnstown, Pa.	\$64.00 B3	\$78.00 B3	\$86.00 B3		4.30 B3	6.45 B3		4.05 B3					
	Fairless, Pa.													
	New Haven, Conn.									6.20 D1 6.50 A5				
	Phoenixville, Pa.					4.20 P2		4.30 P2						
	Sparrows Pt., Md.								4.05 B3	5.75 B3	6.15 B3	8.425 B3		
MIDDLE WEST	Bridgeport, Wallingford, Conn.	\$69.00 N8	\$83.00 N8						4.35 N8	6.20 W1			7.00 N8	
	Pawtucket, R. I.									6.30 N7 6.60 A5				12.75 A5 12.90 N7
	Alton, Ill.								4.225 L1					
	Ashland, Ky.								4.05 A7					
	Canton-Massillon, Dover, Ohio		\$80.00 R3	\$86.00 R3, T5										12.45 G4
	Chicago, Ill.	\$64.00 U1	\$78.00 R3, U1, W8	\$86.00 U1, W8, R3	5.075 U1	4.25 U1, W8	6.40 U1, Y1	4.25 U1	4.05 A1, N4 W8	5.85 A1				
	Cleveland, Ohio									5.75 A5, J3		8.00 A5		12.45 A5
	Detroit, Mich.			\$86.00 R5					4.35 G3, M2	5.85 D1, D2, G3, M2, P11	6.25 G3	8.70 D2, G3		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$64.00 U1	\$78.00 U1	\$86.00 U1, Y1	5.075 J3	4.25 J3, U1	6.40 U1, J3		4.05 J3, U1, Y1	5.85 J3	6.15 U1, J3, Y1	8.00 Y1	6.70 U1, Y1	
	Sterling, Ill.								4.15 N4					
WEST	Indianapolis, Ind.									5.90 C5				
	Newport, Ky.												6.70 Y5	
	Middletown, Ohio									5.75 A7				
	Niles, Warren, Ohio Sharon, Pa.								4.05 S1, R3	5.75 S1, R3, T4	6.15 S1, R3	8.00 S1, R3	6.70 S1	12.45 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$64.00 U1, J3	\$78.00 J3, U1, C11	\$86.00 U1, C11	5.075 U1	4.25 J3, U1	6.40 J3, U1	4.25 U1	4.05 P6	5.75 B4, J3, S7			6.70 S9	12.45 S9
	Portsmouth, Ohio								4.05 P7	5.75 P7				
	Weirton, Wheeling, Fallsburg, W. Va.					4.25 W3			4.05 W3	5.75 F3, W3	6.15 W3	8.00 W3		
	Youngstown, Ohio		\$78.00 C10	\$86.00 Y1, C10		4.25 Y1	6.40 Y1		4.05 U1, Y1	5.75 Y1, C5	6.15 U1, Y1	8.00 Y1	6.70 U1, Y1	12.45 C5
	Fontana, Cal.	\$72.00 K1	\$86.00 K1	\$105.00 K1		4.90 K1	7.05 K1	5.25 K1	4.825 K1	7.50 K1	7.25 K1		8.10 K1	14.55 K1
	Genova, Utah		\$78.00 C7			4.25 C7	6.40 C7							
	SOUTH	Kansas City, Mo.					4.30 S2	6.45 S2				6.40 S2		6.95 S2
Los Angeles, Torrance, Cal.			\$87.50 B2	\$106.00 B2		4.95 B2, C7	7.10 B2		4.80 B2, C7	7.80 C1				
Minneapolis, Colo.						4.70 C6			5.15 C6					
Portland, Ore.						5.00 O2								
San Francisco, Niles, Pittsburgh, Cal.			\$87.50 B2			4.90 B2 4.95 P9	7.05 B2		4.80 B2, C7					
Seattle, Wash.			\$91.50 B2			5.00 B2	7.15 B2		5.05 B2, P12					
Atlanta, Ga.									4.25 A8					
Fairfield, Ala. City, Birmingham, Ala.		\$64.00 T2	\$78.00 T2			4.25 C16, R3, T2	6.40 T2		4.05 R3, T2, C16		6.15 T2			
Houston, Tex.		\$83.00 S2	\$91.00 S2		4.30 S2	6.45 S2				6.40 S2		6.95 S2		

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES(Effective
Apr. 10, 1966)

SHEETS

WIRE
ROD

TINPLATE†

BLACK
PLATEHot-rolled
18 ga.
& heavierCold-
rolledGalvanized
18 ga.Enamel-
ing
12 ga.Long
Tens
18 ga.Hi Str.
Low Alloy
H.R.Hi Str.
Low Alloy
C.R.Hi Str.
Low Alloy
Galv.Hot-
rolled
19 ga.Cokes*
1.25-lb.
base boxElectro*
0.25-lb.
base boxHollowware
Enameling
29 ga.

EAST

Bethlehem, Pa.

Buffalo, N. Y.

Claymont, Del.

Coatesville, Pa.

Conschocken, Pa.

Harrisburg, Pa.

Hartford, Conn.

Johnstown, Pa.

Fairless, Pa.

New Haven, Conn.

Phoenixville, Pa.

Sparrows Pt., Md.

Worcester, Mass.

Trenton, N. J.

MIDDLE WEST

Alton, Ill.

Ashland, Ky.

Canton-Massillon,
Dover, Ohio

Chicago, Joliet, Ill.

Sterling, Ill.

Cleveland, Ohio

Detroit, Mich.

Newport, Ky.

Gary, Ind. Harbor,
Indiana

Granite City, Ill.

Kokomo, Ind.

Mansfield, Ohio

Middletown, Ohio

Niles, Warren, Ohio
Sharon, Pa.Pittsburgh, Pa.
Midland, Pa.
Butler, Pa.

Portsmouth, Ohio

Worren, Wheeling,
Follanshee, W. Va.

Youngstown, Ohio

WEST

Fontana, Cal.

Genoa, Utah

Kansas City, Mo.

Los Angeles,
Torrance, Cal.

Minneapolis, Colo.

San Francisco, Niles,
Pittsburg, Cal.

Seattle, Wash.

SOUTH

Atlanta, Ga.

Fairfield, Ala.
Alabama City, Ala.

Houston, Tex.

† Special coated mfg.
terms deduct 95¢ from
1.25-lb. coke base box
price. Can-making quality
blackplate 55 to 128 lb.
deduct \$2.20 from 1.25-lb.
coke base box.
* COKE: 1.50-lb.
add 25¢.
ELECTRO: 0.50-lb. add
25¢; 0.75-lb. add 65¢;
1.00-lb. add \$1.10. Differ-
ential 1.00 lb./0.25 lb.
add 85¢.

IRON AGE

STEEL
PRICES(Effective
Apr. 19, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BARS						PLATES				WIRE
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Flat Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.			5.975 B3	6.625 B3	6.45 B3					
	Buffalo, N. Y.	4.30 B3,R3	4.30 B3,R3	5.45 B5	5.975 B3,R3	6.625 B3,B5	6.45 B3	4.225 B3,R3		6.45 B3	5.75 W6
	Claymont, Del.							4.225 C4		5.90 C4	
	Coatesville, Pa.							4.225 L4		5.90 L4	6.45 L4
	Conschohocken, Pa.							4.225 A2	5.275 A2	6.45 A2	
	Harrisburg, Pa.							4.225 C3	5.275 C3		
	Hartford, Conn.			5.90 R3		6.925 R3					
	Johnstown, Pa.	4.30 B3	4.30 B3		5.975 B3		6.45 B3	4.225 B3		5.90 B3	6.45 B3
	Fairless, Pa.	4.45 U1	4.45 U1		5.225 U1						
	Newark, N. J.			5.85 W10		6.80 W10					
	Camden, N. J.			5.85 P10							
	Bridgeport, Putnam, Conn.	4.55 N8		5.95 W10	5.225 N8			4.475 N8			
	Sparrows Pt., Md.		4.30 B3					4.225 B3		5.90 B3	6.45 B3
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85 W11 5.95 B5,C14		6.925 A5,B5					6.85 A5, W6
MIDDLE WEST	Alton, Ill.	4.50 L1									5.925 L1
	Ashland, Newport, Ky.							4.225 A7,N5		5.90 N5	
	Canton-Massillon, Mansfield, Ohio	4.40 R3		5.40 R2,R3	5.975 R3,T5	6.625 R2,R3,T5		4.225 E2			
	Chicago, Juliet, Ill.	4.30 U1, N4,W8,R3	4.30 N4,R3	5.40 A5,W10, W8,B5,L2	5.975 U1,R3, W8	6.625 A5,W8, W10,L2,B5		4.225 U1,W8, I3,A1,R3	5.275 U1	5.90 U1	6.45 U1
	Cleveland, Ohio	4.30 R3	4.30 R3	5.90 A5,C13		6.625 A5,C13	6.45 R3	4.225 J3,R3	5.275 J3		6.45 J3,R3
	Detroit, Mich.	4.40 G3 4.45 R5		5.40 R5 5.40 B5,P8 5.45 P3	5.975 R5 5.175 G3	6.625 R5 6.825 B5,P3 P8	6.55 G3	4.325 G3			6.55 G3
	Duluth, Minn.										5.75 A5
	Gary, Ind. Harbor, Crawfordsville	4.30 I3,U1, Y1	4.30 I3,U1, Y1	5.40 M5,R3	5.975 I3,U1, Y1	6.625 M5, R3	6.45 U1,I3, Y1	4.225 I3, U1,Y1	5.275 I3	5.90 U1,Y1	6.45 U1,I3, Y1
	Granite City, Ill.							4.425 G2			
	Kokomo, Ind.										5.85 C9
	Sterling, Ill.	4.40 N4	4.40 N4								5.85 N4
	Niles, Ohio Sharon, Pa.	4.30 R3					6.45 R3	4.225 S1,R3		5.90 S1	6.45 S1
	Pittsburgh, Pa. Midland, Pa.	4.30 J3,U1, C11	4.30 J3,U1	5.40 A5,C8, C11,J3, W10,B4,R3	5.975 U1,C11	6.625 A5,C11, W10,C8,R3	6.45 J3,U1	4.225 J3,U1	5.275 U1	5.90 U1	6.45 J3,U1
	Portsmouth, Ohio										5.75 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.30 W3						4.225 W3, W3			
	Youngstown, Ohio	4.30 U1,Y1, C10,R3	4.30 U1,Y1, R3	5.40 F2,Y1, C10	5.975 U1,Y1, C10	6.625 Y1,C10 6.645 F2	6.45 U1,Y1	4.225 U1,Y1, R3		5.90 Y1	6.45 Y1
WEST	Emeryville, Cal.	5.95 J5	5.95 J5								
	Fontana, Cal.	5.90 K1	5.90 K1		6.125 K1		7.70 K1	4.875 K1		6.45 K1	7.15 K1
	Genova, Utah							4.225 C7			6.45 C7
	Kansas City, Mo.	4.55 S2	4.55 S2		5.325 S2		6.70 S2				6.90 S2
	Los Angeles, Torrance, Cal.	5.90 B2,C7	5.90 B2,C7	6.85 R3	6.125 B2		7.15 B2				6.70 B2
	Minneapolis, Colo.	4.75 C6	4.75 C6					5.975 C6			6.00 C6
	Portland, Ore.	5.95 O2	5.95 O2								
	San Francisco, Niles, Pittsburg, Cal.	5.90 C7,P9 5.95 B2	5.90 C7,P9 5.95 B2				7.20 B2				6.70 C7
	Seattle, Wash.	5.95 B2,P12, N6	5.95 B2,P12				7.20 B2	5.125 B2		6.70 B2	7.35 B2
SOUTH	Atlanta, Ga.	4.50 A8	4.50 A8								5.95 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.30 T2,C16, R3	4.30 T2,C16, R3				6.45 T2	4.225 T2,R3			6.45 T2
	Houston, Ft. Worth, Lone Star, Tex.	4.55 S2	4.55 S2		5.325 S2		6.70 S2	4.55 L3 4.275 S2		5.85 S2	6.50 S2

Steel Prices (Effective Apr. 19, 1955)

Key to Steel Producers

With Principal Offices

A1 Arco Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.
B1 Balcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Dorton & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jenop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit

P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Easton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roehling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycott Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per) l.b.h. mills. Base price about \$200 per net ton.

	BUTTWELD														SEAMLESS											
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.					
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.				
STANDARD T. & C.																										
Sparrows Pt. B3	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0												
Youngstown R3	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0												
Fontana K1	10.75	+4.5	13.75	+0.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0												
Pittsburgh J3	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75				
Alton Ill. L1	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0												
Sharon M3	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0												
Fairless N2	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0												
Pittsburgh N1	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75				
Wheeling W5	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0												
Wheeland W4	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75				
Youngstown Y1	27.25	12.5	31.25	17.5	33.25	21.0	35.75	17.75	36.25	18.75	36.75	19.25	38.25	19.0												
Indiana Harbor Y1	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75				
Lorain N2	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0												
EXTRA STRONG																										
PLAIN ENDS																										
Sparrows Pt. B3	25.25	11.5	29.25	15.5	31.25	19.0	33.75	17.75	34.25	18.75	34.75	19.25	36.25	19.0												
Youngstown R3	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0												
Fairless N2	25.25	11.0	29.25	15.5	31.25	19.0	33.75	17.75	34.25	18.75	34.75	19.25	36.25	19.0												
Fontana K1	14.25		16.25		20.25		20.75		21.25		21.75		22.25													
Pittsburgh J3	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75				
Alton, Ill. L1	25.25	11.5	29.25	15.5	31.25	19.0	33.75	17.75	34.25	18.75	34.75	19.25	36.25	19.0												
Sharon M3	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0												
Pittsburgh N1	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75				
Wheeling W5	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0												
Wheeland W4	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0												
Youngstown Y1	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75				
Indiana Harbor Y1	26.25	12.5	30.25	16.5	32.25	20.0	34.75	18.75	35.25	19.75	35.75	20.25	37.25	19.0												
Lorain N2	27.25	13.5	31.25	17.5	33.25	21.0	35.75	19.75	36.25	20.75	36.75	21.25	38.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75				

Threads only, butt-weld and seamless 2 1/4 pt. higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 4 1/2 pt. higher discount. Butt-weld jubbars discount, 5 pt. Galvanized discounts based on zinc price range of over 9¢ to 11¢ incl. per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2, 1 3/4 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.00¢ per lb.

Steel Prices

(Effective Apr. 19, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U.I.	4.45	5.35	5.425				
So. Chicago A5		5.35		7.30			
Bostley T2	4.45	5.35					
Fairfield T2		5.35		7.30		5.275	
Gary U.I.	4.45	5.35				5.275	
Ind. Harbor I3	4.45		5.425	7.30		5.275	
Johnstown B5		5.35					
Joliet U.I.		5.35	5.425				
Kansas City S2				7.30			11.50
Lackawanna B3	4.45	5.35	5.425			5.275	
Minneapolis C6	4.45	5.35	5.425	7.30		5.275	11.50
Pittsburgh O1					11.00		11.50
Pittsburgh P3					11.00		11.50
Pittsburgh J3				7.30			
Seattle B2				7.00		5.425	12.00
Steelton B3	4.45		5.425			5.275	
Struthers Y1				7.30			
Terrace C7						5.425	
Williamsport S3	5.35						
Youngstown A3				7.30			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb.	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi- Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50		
Trans. 58	13.00		
Trans. 52	14.00		
		Grain Oriented	
		Trans. 80	16.40
		Trans. 73	17.10

Producing points: Beech Bottom (W5); Brackenridge (A5); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N3); Niles, O. (N3); Vandergrift (U1); Warren, O. (A3); Zanesville (A7).

* Coils 75¢ higher.

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. L4	*33.60	
Washington, Pa. J2		
Claymont, Del. C4		
New Castle, Ind. J2		29.75
Nickel-carbon		
10 pct. Coatesville, Pa. L4		39.50
Inconel-carbon		
10 pct. Coatesville, Pa. L4		47.90
Monel-carbon		
10 pct. Coatesville, Pa. L4		40.80

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Wire		Fence Posts		Single Loop Bails		Galv. Barbed and Twisted Barbed Wire		March Wire Ann'd		March Wire * Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col
Alabama City A3	137	146			155	159	6.90	7.30						
Altoona, Pa. J3	137	149			156	6.90	7.45							
Atlanta A8	139	151			157	164	7.00	7.50						
Bartonsville K2	139	151			157	164	7.00	7.50						
Buffalo W6							6.90	7.30						
Chicago, Ill. N4	137	149			155	162	6.90	7.45						
Cleveland A6	142						6.90							
Cleveland A5	139	151			157	164	7.00	7.50						
Crawfordsville M4	137	149			155	162	6.90	7.45						
Danora, Pa. A5	137	149			155	162	6.90	7.45						
Duluth A5	137	149			155	162	6.90	7.45						
Fairfield, Ala. T2	137	149			155	162	6.90	7.45						
Galveston D4	139													
Houston S2	142	154					164	7.15	7.70					
Johnstown, Pa. B3	137	149			155	162	6.90	7.45						
Joliet, Ill. A5	137	149			155	162	6.90	7.45						
Kokomo, Ind. C9	139	149			157	161	7.00	7.50						
Los Angeles B2								7.85						
Kansas City S2	142	158			167	164	7.15	7.90						
Minneapolis C6	142	151	155	160	164	7.15	7.90							
Monessen P6	137	151			163	6.90	7.45							
Moline, Ill. R3			155											
Pittsburg, Cal. C7	146	172			179	182	7.85	8.40						
Portsmouth P7	137	149			155	162	6.90	7.45						
Randall, Pa. A5	137	149			155	162	6.90	7.45						
So. Chicago R3	137	146	150	155	159	6.90	7.30							
S. San Francisco C6							179							
Sparrows Pt. B3	139				157	164	7.00	7.50						
Struthers, O. Y1							6.90	7.50						
Worcester A5	143						7.20							
Williamsport, Pa. S3			150											

Cut Nails, carloads, base \$8.30 per bag at Conshohocken, Pa. (A2). Galvanized products computed with zinc at 11.0¢ per lb.

WAREHOUSES

City		Base price, f.o.b. dollars per 100 lb.											
		Sheets		Strip		Plates		Shapes		Bars		Alloy Bars	
City	Delivery Charge	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	As rolled A 4615	As rolled A 4140	Cold-Drawn A 4615	Cold-Drawn A 4140
		Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	As rolled A 4615	As rolled A 4140	Cold-Drawn A 4615	Cold-Drawn A 4140
Baltimore	5.20	6.02	7.51	7.64	6.69		6.37	6.72	6.88	8.02	12.94	12.54	15.19
Birmingham	.15	6.35	7.35	8.25	6.60	8.85	6.65	6.65	6.50	8.05			
Boston	.10	7.23	8.23	9.52	7.47	9.45	7.34	7.20	7.20	8.60	12.85	12.60	15.25
Buffalo	.25	6.35	7.40	8.75	6.70	7.02	6.65	6.70	6.50	7.40	12.70	12.15	14.80
Chicago	.20	6.38	7.38	8.30	6.62		6.62	6.69	6.51	7.25	12.25	12.05	14.60
Cincinnati	.20	6.49	7.37	8.25	6.86		6.81	6.91	6.75	7.55	12.55	12.35	14.90
Cleveland	.20	6.53	7.42	8.30	6.91		6.86	6.90	6.80				
Denver		6.15	9.00	10.72	8.40		6.69	7.02	6.57	7.35	11.96	12.11	14.76
Detroit	.20	6.57	7.57	8.58	6.90		6.80	7.16	6.79	7.54	12.65	12.25	15.05
Houston	.20	7.35	7.60	9.93	7.70		7.35	7.60	7.70	9.30		13.25	
Kansas City	.20	7.05	8.05	9.97	7.29		7.19	7.36	7.18	8.02		12.72	
Los Angeles	.10	7.50	9.35	9.95	7.85		7.45	7.65	7.45	16.54		13.45	16.60
Memphis	.10	6.79	7.69		6.90		7.01	7.09	6.88	8.25			
Milwaukee	.20	6.47	7.47	8.21	6.71		6.61	6.86	6.60	7.44	12.34	12.14	14.69
New Orleans	.15	6.70	7.65	9.23	6.80		6.90	7.05	6.80	8.60			
New York	.10	6.97	7.78	8.79	7.36	10.15	7.07	7.13	7.30	8.63	12.63	12.43	15.08
Norfolk	.20	7.67	8.56	9.99	7.58		7.27	7.38	7.37	8.63			
Philadelphia	.10	6.19	6.99	8.34	7.06		6.59	6.64	6.84	7.86	12.61	12.36	14.91
Pittsburgh	.20	6.38	7.38	8.30	6.72		6.52	6.69	6.51	7.35	12.25	12.05	14.60
Portland	.20	7.00	7.75	8.90	7.25		6.85	7.00	7.05	10.20			
Salt Lake City	.20	7.45	10.20	10.70	9.05		7.70	7.70	8.80	10.95			
San Francisco	.20	7.35	8.95	9.35	7.00		7.40	7.50	7.35	10.05		13.35	16.50
Seattle	.00	8.10	9.80	10.15	8.20		7.80	7.75	7.80	10.95		13.80	16.45
St. Louis	.20	6.62	7.67	8.54	6.91	8.13	6.81	7.09	6.80	7.64	12.54	12.34	14.94
St. Paul	.20	7.04	8.03	9.06	7.28		7.10	7.35	7.17	8.01		12.56	15.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity. Exceptions: (1) 1600 to 1999 lb. (2) 1000 lb or over. (3) \$3.50 delivery. (4) 1000 to 1999 lb. \$3.50 delivery. * Plus analysis charge.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.61	0.61-0.81	0.81-1.00	1.00-1.35
Bridgeport, New Britain, Conn. N8	5.75	8.05	9.00	11.15	13.95
Buffalo, N. Y. R7	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. S9	5.75	8.05	9.00	11.15	13.95
Cleveland A5	5.75	8.05	9.00	11.15	13.95
Detroit D1	5.85	8.25	9.20	10.95	
Detroit D2	5.85	8.25	9.20		
Harrison, N. J. C11			9.30	11.45	14.15
Indianapolis C3	6.00	8.20	9.00	11.15	13.90
New Castle, Pa. B6	5.75	8.05	9.00	10.95	
New Haven, Conn. D1	6.20	8.35	9.30	11.25	
Pawtucket, R. I. N7	6.30	8.35	9.30	11.45	14.15
Riverdale, Ill. A1	5.85	8.05	9.00	11.15	13.95
Sharon, Pa. S1	5.75	8.05	9.00	11.15	13.95
Trenton R6	6.35	8.30	9.30	11.25	13.40
Wallingford W1	6.20	8.35	9.30	11.45	14.15
Warren, Ohio T4	5.75	8.05	9.00	11.15	13.90
Weirton, W. Va. W3	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. A5	6.40	8.35	9.30	11.45	14.15
Youngstown C3	5.85	8.05	9.00	11.15	13.95

BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox.....	2	13	28.33	33.97	27.48	32.95
	2½	12	38.15	45.74	37.00	44.30
	3	12	44.05	52.82	42.72	51.23
	3½	11	51.43	61.66	49.88	59.81
	4	10	60.29	61.88	66.24	79.47
National Tube.....	2	13	28.33	33.97	27.48	
	2½	12	38.15	45.74	37.00	
	3	12	44.05	52.82	42.72	
	3½	11	51.43	61.66	49.88	
	4	10	60.29	61.88	66.24	
Pittsburgh Steel.....	2	13	28.33	33.97		
	2½	12	38.15	45.74		
	3	12	44.05	52.82		
	3½	11	51.43	61.66		
	4	10	60.29	61.88		

Miscellaneous Prices

(Effective Apr. 19, 1955)

TOOL STEEL

F.o.b. mtl	W	Cr	V	Mo	Co	per lb
18	4	1	—	—	—	\$1.64
18	4	1	—	—	5	2.245
18	4	2	—	—	—	1.705
1.6	4	1.6	8	—	—	.90
6	4	3	6	—	—	1.29

High-carbon chromium73
Oil hardened manganese405
Special carbon27
Extra carbon31
Regular carbon26
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	\$111.80 to \$115.30
6 to 24-in., del'd N. Y.	115.00 to 116.00
6 to 24-in., Birmingham	98.00 to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$.129.50 to \$131.50
Class "A" and gas pipe, 45 extra; 4-in. pipe is \$5 a ton above 6-in.	

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	\$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mennib, bessemer	10.25
Mennib, nonbessemer	10.10
High phosphorus	10.00

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$12.75 to \$13.25
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$17.50
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.00
Swedeland, Pa., f.o.b.	23.00
Palmerville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	23.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	94	22.00	48	110	15.80
20	72	21.25	40	100, 110	8.50
16 to 18	72	21.80	35	110	9.50
14	72	22.00	30	110	8.60
12	72	22.25	24	72 to 94	8.85
8 to 10	80	22.75	38	90	8.85
7	98	23.00	17	72	10.25
6	98	25.50	14	72	10.25
4	40	26.80	10, 12	60	11.10
3	30	30.00	8	60	11.40
2 1/2	30	30.75			
2	24	47.75			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mtl)

Machine and Carriage Bolts

	Discount	Less Case	C.
1/2 in. & smaller x 4 in. & shorter	2	22	
1/2 in. & smaller x 5 in. & shorter	+3	18	
9/16 in. & 5/8 in. x 6 in. & shorter	+4	17	
3/4 in. & larger x 6 in. & shorter	+6	15	
All diam. longer than 6 in.	+15	8	
1/2 in. & smaller x 6 in. & shorter	+3	18	
Lag, all diam. x 6 in. & shorter	6	25	
Lag, all diam. longer than 6 in.	+2	19	
Plow bolts	23	23	

Nuts, H.F., C.P., reg. & hvy.

	Base Discount	Discount, Case or Reg
3/8" or smaller	55	64
3/8" to 1 1/4" inclusive	58	66
1 1/4" to 1 1/2" inclusive	60	67 1/2

C.P. Hex. regular & hvy.

All sizes	55	64
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Hot Galv. Nuts (all types)

3/8" or smaller	38	50
3/8" to 1 1/4" inclusive	41	52 1/2

Finished, Semi-finished, Slotted or Case-fellated Nuts

All sizes	55	66
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Rivets

	Base per 100 lb
1/2 in. & larger	\$9.25
7/16 in. and smaller	37

Cap Screws

	Discount	H.C. Heat Treated
New std. hex head, packaged		
3/8" x 6" and smaller and shorter	38	38
3/8" x 1" x 6" and shorter	15	1
New std. hex head, bulk		
5" x 6" and smaller and shorter	50	42
3/8" x 1" x 6" and shorter	32	31
*Minimum quantity per item:		
15,000 pieces 3/8", 5/16", 3/4" diam.		
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.		
2,000 pieces 3/4", 1", 1 1/4" diam.		

Machine Screws & Stove Bolts

	Discount	Mach. Screws	Stove Bolts
Packaged, package list	33	43	
Bulk, bulk list			
Quantity			
1/4 in.	15,000-99,999	17	59
diam.	100,000-199,999	25	63
& under	200,000 & over	33	67
5/16 in.	15,000-99,999	17	59
diam. &	50,000-99,999	25	63
larger	100,000 & over	33	67
All diam.	5,000-49,999	59	
over 3 in.	50,000-99,999	63	
long	100,000 & over	67	

Machine Screw & Stove Bolt Nuts

	Discount	Hex	Square
Packaged, package list	30	33	
Bulk, bulk list			
Quantity			
3/8 in.	15,000-99,999	15	17
diam. &	100,000-199,999	23	25
smaller	200,000 & over	31	33

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	\$114.00
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$120.00
Childs, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	
California	
Super Duty	
Hays, Pa., Athens, Tex., Windham	137.00
Curtner, Calif.	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	20.00
Silica cement, net ton, bulk, Hays, Pa.	23.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	

Chrome Brick

	Per net ton
Standard chemically bonded, Balt.	\$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	89.00

Magnesite Brick

Standard Baltimore	\$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite

	St. % -in. grains
Domestic, f.o.b. Baltimore in bulk fines removed	\$64.40
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	
in bulk	38.00
in sacks	43.75

Dead Burned Dolomite

	Per net ton
F.o.b. bulk, producing points in: Pa., W. Va., Ohio	\$14.50
Midwest	15.10
Missouri Valley	13.48

FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill.	
Price, net ton; effective CaF ₂ content.	
72 1/2 %	\$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron a.l.f.	11.25¢
New York, ocean bags	
Canadian sponge iron, Del'd in East	12.0¢
F.o.b. ship. pt., carloads	9.5¢
Domestic sponge iron, 98+ % Fe, carload lots	9.5¢
Electrolytic iron, annealed, 99.5+ % Fe	38.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+ % Fe, 63.0¢ to 80.0¢	
Carbonyl iron, size 5 to 10 micron, 98%, 90.8+ % Fe., 83.0¢ to 1.14	
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	51.50¢
Copper, reduced	51.50¢
Cadmium, 100-199 lb. 96¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	\$3.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	\$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	91.0¢
Stainless steel, 316	\$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (66 mesh)	42.95
Zinc, 10 ton lots	17.5¢ to 25.9¢

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(Yokes)



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(Pump bodies)

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How can shell molding help YOU? General Electric maintains a shell-molding laboratory in Pittsfield, Mass., to help users and prospective users of shell molding solve problems and evaluate the process for their own needs. Also, G.E. has prepared an informative 28-page manual telling about the techniques and benefits of this new foundry method. For a free copy of G-E Shell Molding Manual, just write to General Electric Company, Section 522-5A, Chemical Materials Department, Chemical and Metallurgical Division, Pittsfield, Massachusetts.



GENERAL ELECTRIC

Ferroalloy Prices

(Effective Apr. 19, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.
 0.025% C .. 36.00 0.15% C .. 32.75
 0.025% C .. 36.00 0.20% C .. 32.50
 Simplex .. 34.50 0.50% C .. 32.25
 0.06% C .. 34.50 1.00% C .. 33.00
 0.10% C .. 34.00 2.00% C .. 32.75
 65-69% Cr, 4-9% C .. 24.75
 62-66% Cr, 4-6% C, 6.9% Si .. 25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.
 High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
 Carloads .. 25.85
 Ton lots .. 28.00
 Less ton lots .. 29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.
 0.10% max. C .. \$1.18
 0.50% max. C .. 1.16
 9 to 11% C .. 1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)
 Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 2-in. x down, 25.00¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.
 30-32% Cr, 60-65% Si, 3.00 max. Fe.
 Carloads .. 19.00
 Ton lots .. 22.10
 Less ton lots .. 22.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.
 16-20% Ca, 14-18% Mn, 53-59% Si.
 Carloads .. 20.00
 Ton lots .. 22.30
 Less ton lots .. 22.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.
 Ton lots .. 17.50
 Less ton lots .. 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 5-11% Mn, packed.
 Carload lots .. 18.60
 Ton lots .. 18.10
 Less ton lots .. 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
 Carload packed .. 17.50
 Ton lots to carload packed .. 18.50
 Less ton lots .. 20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.
 Producing Point .. Cents per-lb
 Marietta, Ashtabula, O.; alloy, V. Va.; Sheffield, Ala.; Portland, Ore. .. 9.50
 Clairton, Pa. .. 9.50
 Sheridan, Pa. .. 9.50
 Philo, Ohio .. 9.50
 Add or subtract 0.1¢ for each 1 pct Mn above or below base content.
 Briquets, delivered, 66 pct Mn:
 Carloads, bulk .. 11.85
 Ton lots packed .. 13.45

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.
 Manganese Silicon
 16 to 19% 2% max. .. \$84.00
 19 to 21% 3% max. .. 86.00
 21 to 23% 2% max. .. 88.50
 23 to 25% 3% max. .. 91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
 95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
 Carload, packed .. 45.00
 Ton lots .. 43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
 Carloads .. 30.00
 Ton lots .. 32.00
 250 to 1999 lb .. 34.00
 Premium for hydrogen-removed metal .. 0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn .. \$1.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.
 Carloads Ton Less
 0.07% max. C, 0.06% P, 90% Mn .. 32.00 33.85 35.05
 0.07% max. C .. 29.95 31.80 33.50
 0.15% max. C .. 28.45 30.30 31.50
 0.30% max. C .. 26.95 28.80 30.00
 0.50% max. C .. 26.45 28.30 29.50
 0.75% max. C, 80-85% Mn, 5.0-7.0% Si .. 23.45 25.30 26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.
 Carload bulk .. 11.00
 Ton lots .. 12.65
 Briquet contract basis carlots, bulk, delivered, per lb of briquet .. 12.45
 Ton lots, packed .. 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$85.00 gross ton, freight allowed to normal trade area, Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$88.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.
 Ton lots Carloads
 96% Si, 2% Fe .. 20.10 18.00
 97% Si, 1% Fe .. 20.60 18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.
 Carloads, bulk .. 6.55
 Ton lots .. 8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.
 25% Si .. 20.00 75% Si .. 14.40
 50% Si .. 12.00 85% Si .. 16.10
 65% Si .. 13.50 90% Si .. 17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.
 Cast Turnings Distilled
 Ton lots .. \$2.05 \$2.95 \$3.75
 Less ton lots .. 2.40 3.20 4.55

Ferrovandium

35-55% contract, basis, delivered, per pound, contained V.
 Openhearth .. \$3.00-\$3.10
 Crucible .. 3.10-3.20
 High speed steel (Primos) .. 3.20-3.25

Alifer, 20% Al, 40% Si, 40% Fe

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.
 Carloads .. 9.25¢
 Ton lots .. 10.15

Calcium molybdate, 46.3-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo .. \$1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots .. \$12.00
 Less ton lots .. 12.05

Ferro-tantalum-columbium, 20%

Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta .. \$6.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.

.. \$1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton .. \$90.00

10 tons to less carload .. \$110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti .. \$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti .. \$1.50

Less ton lots .. \$1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton .. \$177.00

Ferrotungsten, 1/4 x down, packed, per gross ton contained W, ton lots, f.o.b. .. \$3.80

Molybdenic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. .. \$1.27

bags, f.o.b. Washington, Pa., Langeloth, Pa. .. \$1.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk, lump .. 15.50¢

Ton lots, packed lump .. 16.75¢
 Less ton lots, lump, packed .. 17.25¢

Vanadium Pentoxide, 84 - 89% V₂O₅ contract basis, per pound contained V₂O₅ .. \$128

Zirconium, contract basis, per lb of alloy, 35-40%, f.o.b. freight allowed, ton lots .. 26.00¢

12-15%, del'd, lump, bulk-carloads .. 8.00¢

Boron Agents

Borosh, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3.14%, Si, 49-45%, per lb contained 2 .. \$5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound .. 45¢
 Less ton lots, per pound .. 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound .. 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots .. \$1.20

F.o.b. Wash., Pa.; 100 lb up 10 to 14% B .. 1.85
 14 to 19% B .. 1.20
 19% min. B .. 1.50

Grinal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 .. \$1.00
 No. 6 .. 62¢
 No. 79 .. 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 2.00% max. C, 2 in. x D, del'd.

Ton lots .. \$1.46
 Less ton lots .. 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots .. \$2.05

Silica, contract basis, delivered.

Ton lots .. 45.00¢



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DROP
FORGINGS**

in steel or non-ferrous metals,
from 1/4 lb. to 15 lbs.

Drop Forgings mean stronger, lighter parts: **Bright Finish** means less machining, more accurate dimensions: **RITCO** means absolute reliability.

Our complete finishing facilities are available for machining and grinding. Send blueprints for free estimates.

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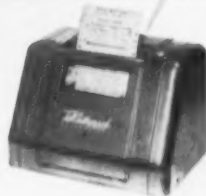
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— Ceco Steel Products Corporation



As this "Instan-Form" message is written in the plant transportation office, it is received in the sales office. This simple operation has not only improved customer service but has reduced telephone and telegraph cost 25%.

TelAutograph offers the only communication system that instantaneously transmits handwritten messages between departments, offices and plants.



At the Ceco plant in Chicago, two TelAutograph Telescriber Systems speed up shipments, reduce shipping costs and expedite shipping information.

System 1: As a warehouse order is released to the shop, the warehouse immediately telescribes complete information to the plant transportation office. Now, with this immediate information the shipping coordinator can consolidate shipments to the same area, reduce the number of trips and secure traffic savings.

System 2: The Transportation Department with their Telescriber System keeps the Sales Department immediately informed of every shipment as it is made. The Sales Department now receives this information up to forty-eight hours earlier providing immediate and authentic shipping information on customer inquiries.

TelAutograph Communications Systems are used to improve: Production Control, Centralised Accounting, Materials Control, Centralised Filing, Quality Control, Sales Orders, Transportation Control and Message Services. For further information write department 1A-54.

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chamfering of
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hole surfaces.

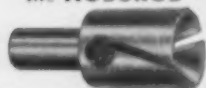
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simultaneously in
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for rapid
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This new BAR-BILLET shear has tremendous power and will cut rounds, flats, squares and special shapes without set-up changes. Clean, square cuts with a minimum of distortion, are guaranteed. Simplicity of design with fewer moving parts insures economical maintenance and the purchase price is **LOW!**

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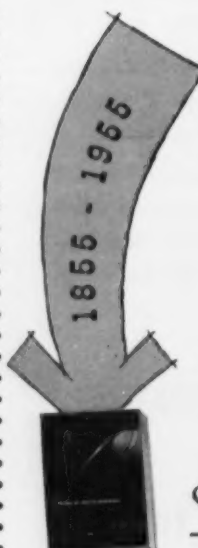
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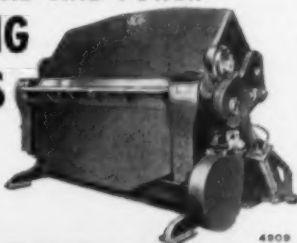
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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Detroit Demand Varies . . . Demand for used machinery in the Detroit area is spotty. The market for toolroom equipment, particularly the universal type, is especially strong. Dealers report a lot of calls for radial drills, jig borers and mills of all types. A scarcity has developed and prices have risen accordingly.

There is an increase in activity for late model machinery. Small size plants can't pay for new machinery but must have the proper facilities to keep their products competitive. Thus the demand for machines in this category is also strong.

Dealers Roam . . . In a few cases, dealers in Detroit are forced to go outside the city to obtain special types of machinery. The only additional cost involved is the freight charge to the customer desiring the special service.

Sales of older machinery are at a standstill. Some dealers report the demand is as low or lower than a year ago. Part of this is attributable to a seasonable slowdown in used machinery. There is also some uncertainty among smaller plant owners over the outcome of the pending UAW contract negotiations. Dealers expect some pickup in this line after the automotive picture becomes more settled.

Prices Hold Firm . . . Prices for older machinery remain steady and are expected to stay that way. If there is any change, it is expected to be slightly downward. The trend to late model machinery has caught some dealers with surpluses of older stock. Then, too, the government has been selling quite a bit of its machinery, although none of this is considered premium quality.

One dealer reports that his prices are extremely close. The cost of late model machinery

keeps going up, he claims. But to keep his own prices competitive, resale margin is cut.

Ship Sweden . . . Shipment of heavy steel mill equipment to Sweden has been announced by Frank B. Foster, Inc., Pittsburgh. The Foster company specializes in used rolling mills and steel works equipment.

The assembly exported was a used, 36 in., Mesta, 2-high reversing blooming mill. Leaving from the West Coast, it is one of the largest pieces of equipment ever loaded out of Los Angeles Harbor.

New York Perks . . . Business continues good in New York with heavy duty equipment looking particularly strong. Fabricating equipment is moving well. Inquiries are up. The area is sharing in the general upswing. However, things never were quite as bad in New York as in other areas.

The great diversity of small manufacturing operations here makes for relatively stable demands. And with small manufacturers getting a good share of defense work, the market is showing extra strength right now.

Philadelphia Story . . . Equipment has been moving in and out of Philadelphia at a good clip for the past 3 months. The Easter holidays slowed things a little but suppliers figure first quarter business is well over last year's.

One builder reports boring mills and heavier milling machines are moving well, and turret lathes are making a better showing.

A steady flow of machinery is moving from Philadelphia to Chicago and the Southwest. This is a normal movement but its strength reflects the general health of the industry.

Not too much good equipment is coming into the market, according to one supplier.

THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSOR

3300 cu. ft. Ingersoll Rand PRE-2 264"x15"x19"
150# Pressure, Complete with Elec. Equip., Air
Receiver, etc. NEW 1953

ANGLE BENDING ROLL

4 x 4 x 1/2" Bertsch Angle Bending Roll, M. D.

BENDING ROLLS

8' x 3/4" Weld 9L-2 Initial Type
10' x 3/4" Bertsch Initial Type
12' x 3/4" Hillis & Jones Pyramid Type
12' x 3/4" Niles-Bement-Ford Pyramid Type
10' x 1/2" Bertsch Initial Type Bending Roll
10' x 1/2" Bertsch Pyramid Type, NEW 1947
20' x 1" Hillis & Jones Pyramid Type Bending Roll

BRAKES—LEAF TYPE

8' x 3/4" Dress & Krump Size 186
12' x 3/4" Dress & Krump, Motor Driven

BRAKES—PRESS TYPE

12' All Steel Press Brake, 250 ton Capacity
Cincinnati All Steel Press Brake 10 1/2"

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H Trav-Lift 30' Span 220/440 A.C.
20' x 3/4" Bertsch Trav-Lift 32' Span 440 Volt A.C.
5 ton Toledo 60' Span 230 Volt D.C.
7 1/2 ton Shepard-Niles 22' Span 220/2/60 A.C.
10 ton Shepard-Niles 48' Span 220 Volt D.C.
10 ton Harmsheffer 50' Span 220/3/60 A.C.
15 ton OBT 45' Span 220/3/60 A.C.
15 ton Case 60' Span 220 Volt D.C.
15 ton P&H 67' Span 115 Volt D.C.
With 220/440 AC Generator Set
25 ton P&H 60' Span 230 Volt D.C.
With 5 ton Auxiliary 60' Span 230 Volt D.C.
20 ton Whiting 60' Span 220/3/60 A.C.
50 ton Niles 60' Span 220/3/60 A.C.
125 ton Cleveland 65' Span 220 Volt D.C.
With 2 Trainers 62 1/2 ton & 10 ton Aux.

CUT-OFF MACHINE

Taylor Wilson Cut-off Machine, Capacity 2 1/2" to
6 1/2" Complete with Hydr. System & Elec. Equip.

DIEMING MACHINE

25 ton Henry & Wright, 1 1/2" Stroke, Double Roll
Feed, Scrap Shear

DRAW BENCHES

50,000# Standard Double Draw, 48' Length of Draw
50,000# McKay Draw Bench, 41' Length of Draw
100,000# Poole Draw Bench, 39' Length of Draw
100,000# Astma Standard, 50' Length of Draw

FORGING MACHINES

1 1/2" 2 1/2" Acme
1 1/2" 2 1/2" 3 1/2" 4" 5" 6" 8" 10" 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100"

FURNACE—MELTING

1 ton Whiting Hydro Arc Top Charge

HAMMERS—BOARD DROP

3000 lb. Chambersburg Model J, Motor Driven
4000 lb. Chambersburg Model F

HAMMERS—BOARD DROP—STEAM DROP—

STEAM FORGING—800 lb. to 20,000 lb.

LEVELERS—ROLLER

34" Astma standard 17 Rolls 4 1/2" Dia.
68" Astma Standard 17 Rolls 4 1/2" Dia.
72" McKay 15 Rolls 4 1/2" Dia.
76" Voss-Ungerer, 23 Work Rolls 2.165" Dia. Ca-
pacity 22 to 15 Gauge Mild Steel

PLATE EDGE PLANERS

35 ft. Southwest, 16 Pneumatic Jacks, M.D.
25 ft. Hillis & Jones, Capacity 1 1/2" Plate

PRESSES—HYDRAULIC

500 ton Wood 4-Columns, 24" Stroke, 12" x 96"
Between Columns
1200 ton Birdsboro 4-Columns, 20" Stroke 30" x 36"
Between Columns

PRESSES—INCLINABLE

20 1/2" Niagara, 150 ton, 13" Stroke
Cleveland, 125 ton, 12" Stroke

PRESSES—STRAIGHT SIDE

2304 Hillis, 4" Stroke
2308 Hillis, 255 ton, 14" Stroke

PRESS—TOGGLE

750 ton Hillis Toledo Model 181-H Toggle Action Press,
48" Ram Stroke, 50" Blankholder Stroke, Incl
Area 140 1/2" 65" Flot 60" Elec. Equip.

PUNCH & SHEAR COMBINATIONS

No. 2 1/2 Buffalo Universal Ironworker
No. 1 Long & Allstatte Double End, Capacity Punch
1 1/2" Jaws Shear 2" Rd. 355 1/2" Angles
Style W Cleveland Single End, 60" Throat, 312 Ton
With Attachment for Dishing Heads

ROLLING MILLS

7 1/2" Metcalf Four High Rolling Mill
8 1/2" Blake & Johnson Single Stand Two High
10" x 14" United Three Stand Two High
12" x 16" Waterbury Farrel Temper Mill
14" x 20" Farrel Birmingham
16" x 20" Waterbury Farrel Single Stand 2-High
16" x 20" Level Two Stand Two High
20" x 36" Poole Two Stand Two High
22" x 38" Three High Breakdown Mill

ROLLS—PLATE STRAIGHTENING

51" Bertsch, 7 Rolls 18" Diameter
51" Bertsch, 7 Rolls 7" Diameter

SHEARS—GATE

48" x 1 1/2" Mackintosh-Hemphill
80" x 3/4" Pola
90" x 1 1/2" Birdsboro
90" x 1 1/2" Garrison

SHEARS—ANGLE

axial" Long & Allstatte Size B
axial" Long & Allstatte Size C

SHEARS—BAR

49 Buffalo Bar Cutter, Capacity 3" sq., 3 1/2" Rd.

SHEAR—BEAM

Pola DT-36-B Beam Shear, Capacity 3" to 15" i-
beams 600 1/2" Angles, Bolted Motor Drive

SHEAR—GUILLOTINE

25 Hillis & Jones, Capacity 4 1/2" Round, 4" Square

SHEARS—ROTARY

3/16" Quickwork Rotary Shear, 36" Throat
1/2" Kline #250, With Flanging Attachment
1/2" Quickwork Whiting #40A—NEW 1953

SHEARS—SQUARING

10' x 1 1/2" Cincinnati—LATE
12' x 3/4" American
130" x 1 1/2" Niagara #818
150" x 3/4" Birdsboro

SLITTERS

24" Torrington Heavy Duty Slitter
26" Yoder Slitting Line with Coilers
28" Paxson Cut & Sheet Slitter
72" Yoder Sheet Slitter

STRAIGHTENERS

No. 1 Medart Continuous Automatic Straightening
Machine Capacity 3/4" to 1 1/2" Dia. Bar any
length or up to 3" Tubing, Motor Driven
No. 2 Taylor Wilson Straightening Slitting & Burnish-
ing Machine, Capacity 1/2" to 1 1/2" Tubing

TESTING MACHINES

5,000 lb. Olsen Hydraulic Lap-Cap Universal
2,000 lb. Riehle Model PB-2 Universal
10,000 lb. Tinius Olsen Universal
50,000 lb. Baldwin Southwark Comp. Testing Machine
60,000 lb. Tinius Olsen Universal Hydraulic
100,000 lb. Tinius Olsen Universal
200,000 lb. Riehle Model MA-200 Universal

TRIMMER

No. 438V Quickwork Whiting Stamping Trimmer
WELDER
100 KVA Progressive Univ. Seam Welder, 220 v, 60 cy.

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2500# Ransome Model 25-P—NEW 1950

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48.6 CFM 3500 psi 3 stage Ingersoll 25 HP Elec
142 CFM 125 psi 6/8/5x5 Ingersoll Type 40—25 Elec
211 CFM 100 psi 9/10/9 American 40 HP Elec
254 CFM 100 psi 10x10 Ingersoll ER-1 40 HP Elec
258 CFM 500 psi 10 1/4x10 Ingersoll 75 HP Synch
278 CFM 120 psi 2 stage Chicago PB-50 HP Elec
285 CFM 125 psi 2 stage Gardner "WB" 50 HP
291 CFM 40 psi 3 cylinder Ingersoll Type 40
343 CFM 500 psi 11 1/2x13 Worth Elec. or steam
355 CFM 100 psi 12 1/2x10 American WTR 60 HP Elec
364 CFM 20 psi 12x7 Gardner "RX" 2 available
400 CFM 20 psi Nash-Hytor L-5
450 CFM 4 psi Spencer Turbo
460 CFM 125 psi 15/20x10 Ingersoll XRB—Duplex
510 CFM 125 psi 15/20x12 Ingersoll XRB—Duplex
676 CFM 125 psi 15/9/12 Ingersoll XRB—Duplex
861 CFM 50 psi 17x11 Ingersoll ES-1
931 CFM 55 psi 17x13 CPT Elec. or steam
1085 CFM 35 psi 20x12 Penn-3A 100 HP Elec
1292 CFM 35 psi 20x13 Chicago T-B 125 HP Elec
1351 CFM 125 psi 18 1/2x11 1/2x8 1/2 Worth YC 2
1574 CFM 100 psi 22 1/2x16 Ing PRE 2
1723 CFM 110 psi "XPV" 4 corner Ingersoll steam
5780 CFM 60 psi 28-28x27 Ing PRE 1 700 HP
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36" & 42" Bullard vertical turret lathes
No. 2 P & W. Jig Borer, Model 1278.
3" Bar Yoder, table type, 1942.

DRILLING MACHINES

4" arm 13" col. Carlton radial, P.F., P.E.
6" arm 16" col. American radial, H.D.
4" arm 13" col. Foxfield, Hyd., new 1941.

GRINDING MACHINES

16" x 120" Landis gas type cyl. grinder, hyd.
40" No. 16A2 Blanchard 2-spd. rotary, new 1946.
72" Hanchett 3-spd. rotary surface, new 1946.
6" x 18" Landis cyl., 30 deg. 4 Head, 1941.
16" x 90" Landis gas type cylindrical, new 1941.

LATHES

No. 5 Jones & Lamson ram type univ. turret (2) late.
14" x 8" Hendey Toolroom, 1940.
12" x 30" Monarch Model C, new 1942.
18" x 30" Lipe Carbo-Matic, 1942.
9" x 18" Hendey Prod., Tool & Gauge, 1940.

MILLS

1-18 & 2-18 Cincinnati production,
1-2-3-4-5-6 knee type plain & vertical.
No. 30 Brown & Sharpe, pl. horiz., 1942.
24" x 24" x 12" Ingersoll adj. rail planer type, 1945.
42" x 42" x 18" Ingersoll adj. planer type.
60" x 48" x 18" Ingersoll adj. rail planer type.
No. 2H K & T plain horiz., new 1942.

PRESSES

108 ton No. 95C Toledo S.S., D.C., cushion.
180 ton 784C Versen Gas Frame.
150 ton No. 13-1 Cleveland QBI, late type.
300 ton No. 1039 Hamilton D.C., adj. bed 60" x 102".
400 ton No. 563 Toledo K-J coining or embossing.
500 ton Baldwin Southwark HYPERED Mfg., 50.
1000 ton No. 666 Toledo coining or forging.
600 ton Minster K-J Coining, 1941.

SHAPER

24" G & E M-Duty universal.
32" G & E Invincible, F.M.D., late type.

UPSETTERS

1 1/2" Natl. susp. slides, auto-tub. guided ram.
1 1/2" Ajax, suspended slides, steel forms.
5" Ajax, suspended slides, steel frame.

1000 Tools in Stock

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Eastern Rebuilt Machine Tools

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VERTICAL MILLING MACHINES

No. 18 Sundstrand, m.d.
No. 1-14 Kent Owens, m.d.
No. 08 Cincinnati, m.d., latest
Newton Vertical Miller, rotary table
54" Ingersoll Single Spindle Adjustable Rotary
Mill, m.d.
54" Ingersoll two spindle Rotary Mill, m.d.
No. 4 Cincinnati Vertical High Power, m.d.,
Timken
4 spindle 360 degree Cincinnati Automatic Pro-
filing Machine, m.d.
No. 4 Cincinnati Medium Speed Dial Type Miller,
m.d.

THREAD MILLING MACHINES

14"x16" U4 Automatic Hob, m.d.
Hall Planetary, m.d.
6x14", 4x20" Pratt & Whitney
10x24" Hanson Whitney, m.d., latest
No. 40 Lees-Bradner Auto. Universal, m.d., late
Model LT Lees-Bradner, with collet attachment

UNIVERSAL MILLING MACHINES

No. 2 Denbigh, m.d., brand new

No. 285 Milwaukee, m.d.
No. 4A Brown & Sharpe, m.d.

MANUFACTURING TYPE MILLING MACHINES

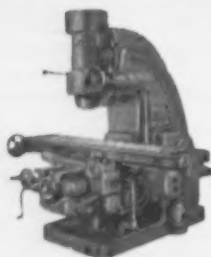
Taylor & Fenn 2 spindle Spine Miller, m.d.
No. 00 Sundstrand Hydraulic Rigidmill, m.d.
No. 3A Sundstrand Copy "Rigidmill", m.d.
No. 15 Sundstrand, m.d.
No. MM-1-4 U.S. Multi Miller, m.d.
4" Pratt & Whitney Spine Miller, m.d.
18", 24" Cincinnati Plain Automatic, m.d.
14" Cincinnati Duplex Automatic, m.d.
14" Garvin Cam or Form Milling Machine, m.d.
No. 21 Brown & Sharpe Automatic, m.d.
48"x16" Newton Slab Miller, m.d.
54"x30"x16" Ingersoll Slab Miller, m.d.
No. 3 Niles Cotter & Keyseat Milling Machine,
m.d.
No. 3-30 Cincinnati Duplex Hydraulic Miller,
m.d. in base
M80 Taylor & Fenn Duplex Spine Miller, m.d.,
latest type
Model 1402 Kearney & Trecker Simplex, m.d.

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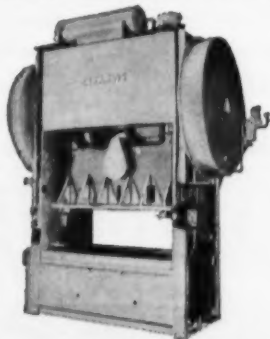
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1	2000	Whae.	Mill	600	230/460
2	1500	Whae.	Roe	600	800
1	1400	G.E.	MCF	600	63/190
1	1200	G.E.	MCF	600	750/950
1	940	Whae.	QM	250	140/170
1	825	Whae.		250	450/550
1	600	Whae.		250	95/190
1	600	Al. Co.		250	400/800
1	500	Whae.	CC-216	600	200/800
1	500	G.E.	MCF	250	200/800
2	450	Whae.		5-9	415
1	250	G.E.	MPG	230	400/600
1	200	Har	1878T	230	720
4	200	G.E.	CD-1460Z	230	500/1500
1	200	Whae.	CB-5113	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	250	1150
1	150	Cr. Wh.	88H-TBFC	230	890
1	150	Whae.	HK-151B	230	900/1800
1	150	Whae.	HK-281	230	360/910
1	150	G.E.	MCF	230	250/1000
1	125	Whae.	HR-141	230	500/1500
1	125	Whae.	HR-143	230	850

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1	2000	G.E.	600	300	11000
2	2000	G.E.	614	600	6600/13200
2	2000	G.E.	650	600	2800/1400
1	1500	G.E.	720	600	6600/13200
1	1500	C.W.	814	30/115	4000/13000
1	1000	G.E.	900	360	6500
2	1000	G.E.	730	275	2300/4000
2	750	C.W.	814	30/115	2300
1	600	G.E.	730	250	440/2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	5000	Whae.	OTBC	3	3300/26400
1	3500	Whae.	OTBC	3	26400/13200/6600
2	2000	G.E.	HVDDJ 1		66000/13200
2	1000	G.E.	HVDDJ 1		13200/6600
2	1000	Wagner	OTBC	1	13200/6600
2	400	G.E.	HD	1	13200/2300

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1000	G.E.	13200	600
500	Westg.	1600	250
400	G.E.	2300	270
400	Al.-Ch.	2300	120/240
250	Westg.	2300	125/250
200	G.E.	2300	250/275
200	Westg.	4100/2200	275
200	Ridgeway	2300	250
170	G.E.	440	125
150	G.E.	3300	125/250
150	Al.-Ch.	2300	275
150	Westg.	2300	125/250
150	G.E.	440	275
100	G.E.	2300	250
100	Weste	440	125
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100	G.E.	440	125
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1	1500	G.E.	814	350	13,200/6600
2	1200	Whae.	730	600	2300
1	1000	G.E.	900	360	2300
3	1000	Whae.	814	600	11,000/6600
1	500	C.W.	730	575/600	2300/440
2	500	Whae.	1200	125/250	2300
1	450	C.W.	730	250	2300/440
1	400	C.W.	1300	135/250	2300/440
3	200	G.E.	900	125/250	2300
1	200	Whae.	1200	600	2300/440
1	150	G.E.	730	350	2300/440
1	100	Whae.	900	250	2300
1	100	C.W.	1200	125	440/220
1	300	Whae.	1200	250	4160

DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	3000	Whae.	Kncl.	525	600
1	2000	Whae.	Mill	600	230/460
6	1500	Whae.	Kncl.	525	600
1	1200	G.E.	MCF-6	600	350/790
4	800	Whae.	Kncl.	525	600
1	800	Whae.	Mill	300	250/550
5	700	Whae.	Kncl.	525	300/700
2	500	Whae.	Mill	250	285/710
1	350	G.E.	CD-160-A	230	1150
1	250	G.E.	MPC	230	325/975
1	250	G.E.	MCF	600	300/685
1	200/250	El. Dy.	222	230	400/1200
1	200	Whae.	Mill	230	300/1500
1	200	G.E.	MDP-420	250	350/410
1	180	G.E.	MPC	250	400
1	150	Whae.	HK-201	230	300/900
1	125	Whae.	HK-184	230	575/850
1	125	Whae.	HK-190	600	600
1	125	G.E.	MPC-6	250	400/600
1	90/160	G.E.	MPC	250	625/1125
4	90	El. Dy.	2-30	250	450/1350
3	75	C.W.	58-H	230	860
1	75	Cont.	DI47X	230	425/1275
3	50	Whae.	HK-131-5	230	600/2300
1	40	Whae.	HK-110	230	500/1700
1	40	G.E.	CD-123	230	500/1000
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6 inches	65.50	61.20	54.00	54.00	51.85	48.95
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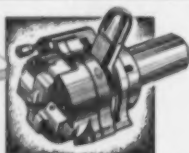
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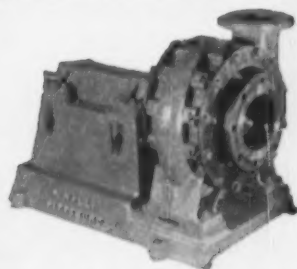
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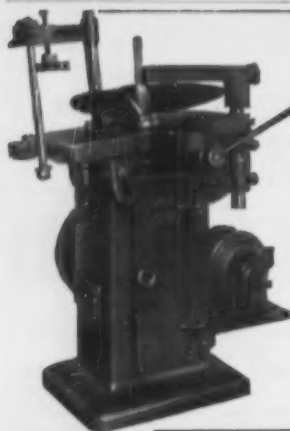
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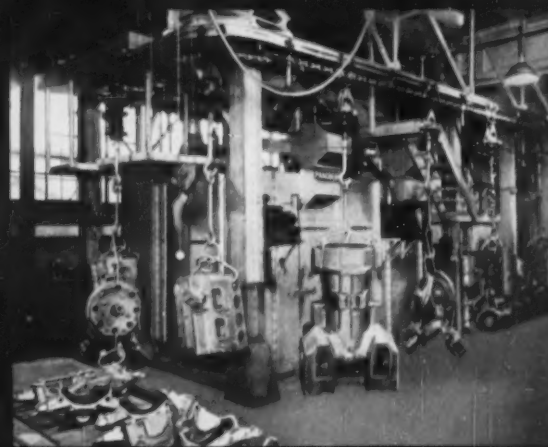
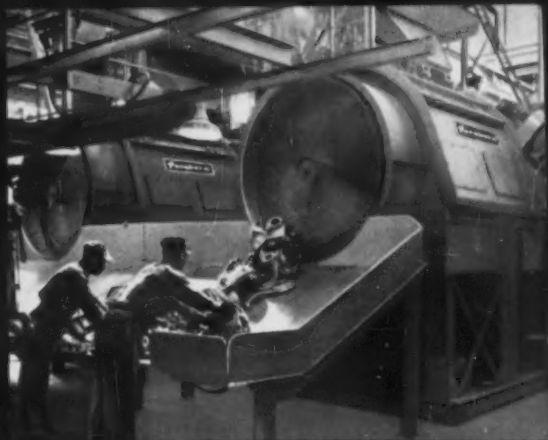
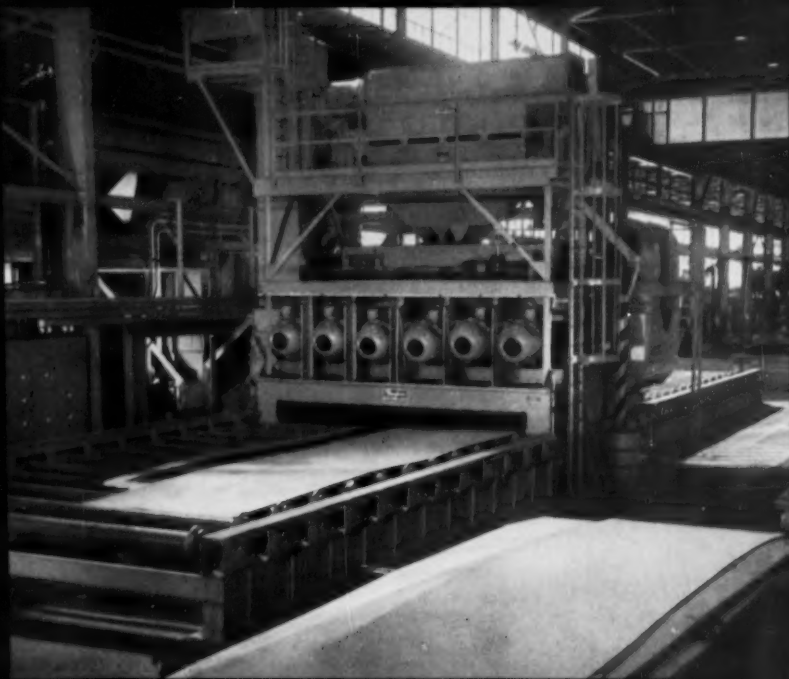
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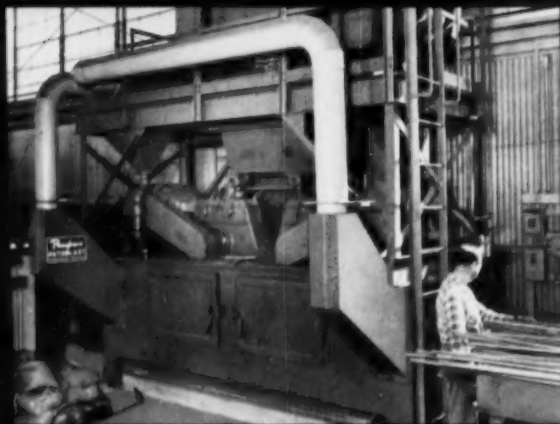
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**Rotoblast Tables
& Table-Rooms**



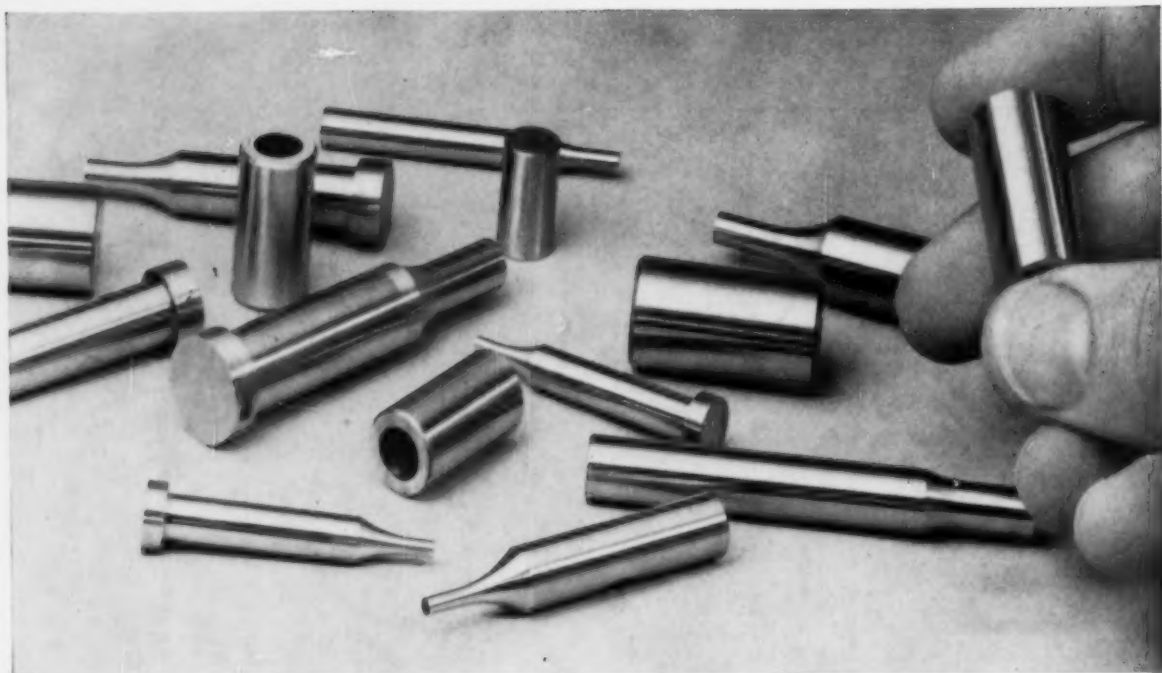
**Special Blast Rooms
& Cabinets**



**Pangborn Dust
Control Equipment**



**Malleable®
Shot & Grit**



How the country's largest exclusive producer of punches and dies changed complaints to contracts *... with Graph-Mo® steel*

PORTER Precision Products, Cincinnati, Ohio, is the country's largest exclusive manufacturer of punches and dies—37,000 different sizes in stock. Formerly, Porter produced these products from water-hardening and other high-carbon tool steels, but found that such steels presented distinct disadvantages. For example, they distorted in heat treating, were relatively expensive and difficult to machine, and did not meet customers' demands for longer life.

With a view to correcting these problems, Porter engineers adopted Graph-Mo®—one of four graphitic tool steels developed by the Timken Company—as a standard for the manufacture of punches and die buttons. Because it contains free graphite, Graph-Mo is easier to machine. And punches and dies made of Graph-Mo don't scuff or

gall. From every aspect, Porter's adoption of Graph-Mo steel has proved eminently successful.

Graph-Mo outwears ordinary tool steels on an average of three to one. Millions of tiny particles of diamond-hard carbide—one of the most wear-resistant substances known—give Graph-Mo steel longer service life.

Graph-Mo may be the solution to *your* punch and die problems. For more information about all four graphitic steels developed by the Timken Company, and their uses in dies, punches, gages, and machine parts, write for the new Timken Graphitic Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING